Capacity Building Of ICDS Functionaries In Growth Monitoring And Promotion And Infant And Young Child Feeding Practices: Impact On Nutritional Status Of Under Twos

BY

PURVI D KARKAR

THE DEPARTMENT OF FOODS AND NUTRITION
FACULTY OF FAMILY AND COMMUNITY SCIENCE
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA
VADODARA

July 2013

Capacity Building of ICDS Functionaries In Growth Monitoring And Promotion And Infant And Young Child Feeding Practices: Impact On Nutritional Status Of Under Twos

A Thesis Submitted In Partial Fulfillment of The Requirement For The Degree of Doctor Of Philosophy (Foods And Nutrition)

BY

Purvi D Karkar

PhD Registration No. 307

THE DEPARTMENT OF FOODS AND NUTRITION
FACULTY OF FAMILY AND COMMUNITY SCIENCE
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA
VADODARA

July 2013

Certificate

This is to certify that the research work presented in the results of this thesis has been carried out independently by Ms Purvi Karkar in pursuit of a Doctoral Degree in Foods and Nutrition and represents her original work.

Dr. Kavita Sharma
Guide

Prof. Uma Iyer
Head,
The Department of Foods and Nutrition
Faculty of Family and Community Science
The Maharaja Sayajirao University Of Baroda
Vadodara

Date: July 2013

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to those who have contributed to this thesis and supported me in one way or the other during this remarkable journey.

First and foremost I offer my sincerest gratitude to my guide, ***Dr. Kavita Sharma***, for her guidance and support. My sincere thank you to ***Prof. Dr. Pallavi Mehta*** and ***Prof. Uma Iyer***, Head, Department of Foods and Nutrition for being very supportive and encouraging all throughout this years. Very special thanks to the Foods and Nutrition Department, M. S. University for giving me the opportunity to carry out my doctoral research and ***University Research Scholarship***.

My PhD is an extension of my ongoing work in Public Health Nutrition, wherein I have grown interacting and working with many exceptionally experience mentors; ***Dr. P V Kotecha***, ***Dr. Suresh Joshi*** and ***Dr. Sheila Vir***. My special thanks to all three of my mentors, as well as ***Dr. Sangeeta Patel*** and ***Dr. N. Nakkeeran*** for their direction, interactions and inputs to my work in PHN including my PhD.

I am also thankful to ***Mona & Apeksha*** for assisting in data collection, and to my friends ***Dimple, Pratiksha, Shruti, Neha & Rujuta*** for all their support, and also for being there to listen when I needed an ear.

Special thanks to CDPO ***Ms. Naynaben Pargi*** for stepping forward and inviting me to do this project in her area. A big "Thank you!" to everybody who participated in this study the ***children, mothers*** and ***pregnant women*** of 36 Anganwadi center villages, ICDS Supervisors ***Ms. Rashmiben Trivedi*** and ***Ms. Varshaben Raval*** and my enthusiastic ***36 AWWs*** for their trust and cooperation my work.

Words cannot express the feelings I have for my ***parents*** and my ***in-laws*** for their constant unconditional support.

Finally, I would like to acknowledge the most important persons in my life – my parents ***Mukta*** and ***Devendra Karkar*** and my husband ***Mitesh Parikh***, you three have been my constant source of strength and inspiration. I can honestly say that it was only determination and constant encouragement (and sometimes a kick on my backside when I needed one) from three of you, that ultimately made it possible for me to see this project through to the end. Lots of love, to my daughter "***Vidita***", and apologies for if in the event of my work knowingly or unknowingly I overheard any of her needs.

These are few excellent people in my life whom I have mentioned, I have always been fortunate to have many well wishers and good souls around. I thanks them all, whose name I may have not mentioned.

With Best Regards

Purvi Karkar Parikh

List of Contents

List of Tables

List of Figures

List of Annexure

List of Abbreviations

ANC	Antenatal Care
ASHA	Accredited Social Health Activists
AWC	Anganwadi Center
AWW	Anganwadi Worker
BF	Breastfeeding
BFHI	Baby-Friendly Hospital Initiative
CF	Complementary Feeding
CG	Control Group
DCT	Dipak Charitable Trust
DLHS	District Level Household and Facility Survey
DWCD	Department of Women and Child Development
EBF	Exclusive Breastfeeding
EIBF	Early Initiation of Breastfeeding
FHS	Female Health Supervisor
GMP	Growth Monitoring and Promotion
GOI	Government of India
HAZ	Length/height-for-age z-score
ICDS	Integrated Child Development Services
IFA	Iron Folic Acid
IG	Intervention Group
IMNCI	Integrated Management of Neonatal and Childhood illness
IYCF	Infant and Young Child Feeding
LBW	Low Birth Weight
LHV	Lady health visitor
MMF	Minimum Meal Frequency
MDD	Minimum Dietary Diversity
MAD	Minimum Acceptable Diet
Mo.	Months
MPHW	Multipurpose Health Worker
MS	Mukhya Sevika/ ICDS Supervisor
MUACZ	Mid-upper arm circumference-for-age z-score
NFHS	National Family Health Survey
OR	Odds Ratio
PHC	Primary Health Centre

RCH	Reproductive Child Health
RD	Risk Difference
RR	Risk Ratio
RTE	Ready-to-eat
SAM	Severe Acute Malnutrition
SC	Sub Centre
SF	Supplementary Feeding
SNP	Supplementary Nutrition Program
HVs	Home visits
NHE	Nutrition Health Education
TIBF	Timely initiation of breastfeeding
U-2	Under 2 years
U-6	Under 6 months
VHND	Village Health and Nutrition day/*MAMTA DAY*
WABA	World Alliance for Breastfeeding Action
WAZ	Weight-for-Age z-score
WBF	World Breastfeeding Week
WHO	World Health Organization
WHZ	Weight-for-length/height z-score

ABSTRACT

An estimated 101 million children under 5 years of age were underweight in 2011, representing approximately 16% of the world's under 5 children (UNICEF/WHO/WB 2012). Although the prevalence's of stunting and underweight among children under 5 years of age worldwide have decreased since 1990, overall progress is insufficient and millions of children remain at risk. Underweight prevalence is highest in South Asia, which has a rate of 33%. The prevalence of underweight children under 5 years is an indicator to measure progress towards MDG 1, which aims to halve the proportion of people who suffer from hunger between 1990 and 2015. Also, stunting and other forms of undernutrition reduce a child's chance of survival, as well as hinder optimal health and growth. The achievable imperative for global progress confirms that a key to success against stunting is focusing attention on pregnancy and the first two years of a child's life (UNICEF 2013).

In India, poor feeding practices in early childhood contribute to the burden of malnutrition, as well as infant and child mortality. India depends heavily on the package of services provided by ICDS, to address the problem of undernutrition at grassroots level. Educating mothers on optimal IYCF practices and child nutrition in the community is one of the components of ICDS, in which the *Anganwadi* workers (AWWs) need to play a vital role. The 11th Five-Year Plan paper on "Strategies for children under-six" states that: "An essential element for securing better operational results is better capacity building" (GOI 2007).

According to NFHS-3 (2005-06) survey, in Gujarat, the prevalence of underweight (41.1%) and stunting (49.2%) among children below three years is even higher than the national average (NFHS-3 Gujarat 2008). Further, the DLHS-3 (2007-08) survey for Gujarat showed that only 19.5% children 6-24 months met all three criteria of optimal IYCF feeding i.e. Early Initiation of Breastfeeding (EIBF) within one hour of birth, Exclusive Breast Feeding (EBF) for first six months and Introduction of Complementary Food with breastfeed from 7 months onwards (DLHS-3 2010). This seems to indicate that, poor IYCF practices are possibly the primary reason for the high levels of undernutrition in Gujarat.

Globally and especially in India, Growth Monitoring and Promotion (GMP) is widely recommended as a community based tool for child survival. The 11th Five-Year Plan recommends, weighing of all children under 3 years at the *Anganwadi* centre (AWC) and counselling their mothers, as a key coverage, as well as service quality indicator

(GOI 2007).

It is important to assess the knowledge and skills of the ICDS field level functionaries, the AWWs, in carrying out the growth monitoring and promotion function and build their capacities based on the gaps observed. Also, as appropriate IYCF practices are critical for the nutritional wellbeing of a child, it is essential to build the capacities of the AWWs in this aspect. The effect that these would have on the IYCF practices in the community and the nutritional status of children needs to be assessed. In view of this, an interventional operational research study was undertaken in semi-tribal Vadodara with the aim to answer the following research question:

Whether capacity building of ICDS functionaries, on GMP and IYCF practices can bring about a required change in the IYCF practices of parents and care providers, and eventually a reduction in undernutrition among children under two years of age?

The ***broad objective*** of the study was: "To build the capacity of *Anganwadi* workers of ICDS scheme on Growth Monitoring and Promotion, and Infant and Young Child Feeding, and to assess its impact on Infant and Young Child Feeding Practices and nutritional status of children under two years."

Methodology: Two ICDS sectors, with similar nutrition profile (27% and 28% children in normal grade) and weighing efficiency (90% and 92%) for children under 3 years of age, as per ICDS Monthly Progress Report (MPR) were purposely selected from Waghodia Taluka of Vadodara district of Gujarat, as Intervention Group (IG) having 19 Anganwadi Centers (AWC) and Control Groups (CG) with 17 AWCs.

Pre and post capacity building, all the AWWs (17+19) and their Supervisors (2) were assessed with regard to their knowledge and perceptions of IYCF and GMP. In each group the anthropometric measurements (Health, Weight and MUAC) of all children (~600 in each group) under two (U-2) years of age were assessed. Further, a sub-sample of around 290 children, in each group, selected from the cross sectional population of children U-2, during the pre and post assessment, was assessed for IYCF practices.

Capacity Building: The capacity building of IG AWWs was conducted over a span of 6 months, which included group and hands-on capacity building (individual on the job). The techniques used for capacity building were lectures, discussions and practical sessions, demonstrations and on-the-job training. Through role plays, discussions and on the job training, the focus was to enhance the counseling skills of AWWs and prioritize GMP and IYCF counseling on *MAMTA DAY*s and during home visits. During the on-the-job-capacity building (monthly *Seja-Sector* meeting) the AWWs were assisted in identifying the weak links behind the failure in achieving the required behaviour change towards adaptation of optimal IYCF practices by the

families. These in turn helped in developing special messages on IYCF as well as develop a road map on how to conduct GMP and counselling on IYCF during contact points like *MAMTA DAY*s, home visits, IMNCI visits and SNP distribution.

Process Evaluation through Concurrent Assessment: Post capacity building, the process evaluation of field practices related to GMP and IYCF was planned through concurrent assessment. Overall, 43 AWCs visits in IG (n=19), and 35 AWCs visits in CG (n=17) were made, covering at least one routine day and one *MAMTA DAY* from each AWC. During the process evaluation, it was found that the quality of implementation of services, related to IYCF counseling (55.6% vs. 21.3%, based on exit interview of children U-2 on *MAMTA DAY*), use of *MAMTA* card IYCF guidelines (26.6% vs. 20.0%) and GMP activities, such as weighing (36.8% vs. 26%), plotting on *MAMTA* card (23.6% vs. 16.7%) and counselling (11.1% vs. 5.7%) of children U-2 (other than those who came for routine vaccination) on *MAMTA DAY*, was better in IG as compared to CG. This improvement in quality of services also showed improved KAP of mothers of children U-2 about IYCF practices and nutritional status of children U-2, as discussed later.

Knowledge and Perceptions of the Anganwadi Workers: The baseline knowledge and perceptions assessment of AWWs and ICDS-Supervisors identified vital gaps with regard to the rationale applicable to the recommended optimal IYCF practices, as well as implementation of GMP and use of IPC skills for effective counselling. None of the AWWs knew the complete rationale for promoting breastfeeding till 2 years and beyond. Merely 65% AWWs recommended food with thick consistency and very few AWWs were aware about appropriate feeding during (18%) and after illness (6%). Only 64% AWWs listed growth monitoring as a tool for measuring growth and/or detecting growth faltering, and 33% related it as a tool for giving advice based on child's nutritional status. The AWW and their Supervisors could only identify two to three out of five key steps in effective counseling.

Post capacity building, the major improvement was noted among IG-AWWs with regard to addressing mothers' query about "*Not Enough Breast Milk'*, EIBF, type of CF, continuation of breastfeeding along with CF and IPC skills, which were some of the major challenges identified at baseline. The overall knowledge score of IG-AWWs improved significantly ($p<0.001$) by 35.3%, as compared to a 3.6% increase in CG. Also, the difference between the post intervention knowledge score of IG and CG was statistically significant ($p<0.001$). The mean knowledge score of IG-AWWs improved significantly for 15/24 indicators, as compared to only 2/24 indicators in CG. The mean knowledge score of IG-AWWs was better than CG for 21/24 indicators and significantly better for 11/24 indicators. The IG-Supervisor was also

able to articulate the correct reasons behind adopting these recommended practices, which was the key focus of capacity building.

Infant and Young Child Feeding Practices

Knowledge and Perceptions of Mothers: During the baseline assessment, the counseling by AWWs about breastfeeding practices was low: 10% (no prelacteal feed) to 15% (EIBF) during pregnancy, and 8% (EBF) to 12% (breastfeeding attachment, positioning) post-natal. As a result, the knowledge, perceptions and practices of pregnant and lactating mothers related to breastfeeding practice was below 50% and CF was even poorer. The correct knowledge related to some key IYCF practices like EIBF (39%), EBF (44% LM, 23% PW), age of introduction of CF (30.9%), continued breastfeeding till 2 year and beyond (13% PW, 16.8% LM) and introduction of top milk before 6 months (15.5% mothers U-6 mo.) was below 45%.

Post capacity building, the impact of capacity building was mainly noted on the IG mother's knowledge regarding key breastfeeding practices like the three early breastfeeding practice, EBF and continued breastfeeding till 2 year and beyond. The knowledge of IG pregnant women improved significantly for all 3 early breastfeeding practices within IG, and the improvement was better within IG (EIBF 35.7%, colostrum feeding 21.3% and no prelacteal feeding 62%) as compared to CG. The knowledge about EBF improved more significantly for IG lactating mothers ($p<0.001$), as compared to CG ($p<0.01$). The appropriate response related to breastfeeding frequency, duration and adequacy improved among IG pregnant and lactating women by 4.1% (12.9% vs. 8.8%) and 10.5% (13% vs. 2.5%) more than CG. This could be as a result of significant improvement in counseling by IG-AWWs during pregnancy (7.9 time $p<0.001$ IG vs. no change CG) and postnatal (2.4 times IG vs. 1.1 times CG), due to the capacity building. The knowledge score, regarding breastfeeding and mother's health, improved in IG by 17% (32.4% vs. 15.4%) as compared to CG.

Post capacity building, there was a significant ($p<0.01$, t-value-2.612) shift in the knowledge of IG mothers, regarding the mean age of introduction of top milk (9.56 ± 9.18 to 6.57 ± 4.90). Also, more mothers from IG, as compared to CG, showed improved knowledge regarding consistency of CF (more mothers recommended medium to thick consistency), optimal feeding frequency of children 7-11 months (better by 18%), breastfeeding during diarrhea (↑5.1% vs. ↓6.3%), responsive feeding behaviour and hand-washing with soap and water before CF (↑87% vs. ↑78%, $p<0.001$ in both the groups). Also, the knowledge regarding responsive feeding behaviors like self-feeding (↑23% vs. ↓32.6%), monitoring the child while eating

(↑7.8% vs. ↑3.2%) and encouraging the child to complete the given food (↑2 times $p<0.01$ vs. ↑1.7 times $p<0.05$) improved in IG as compared to CG.

The overall improvement in appropriate response related to IYCF practice was also better among IG pregnant by 10.6% (131.7% vs. 121.1%) and lactating mothers by 4.1% (121.8% vs. 117.8 %) as compared to CG. This transformation may be attributed to the quality of messages and guidance provided by IG AWWs to mothers during counseling as compared to CG, as a result of the capacity building of AWWs.

IYCF Core Indicators: At baseline, the assessment of IYCF practices revealed that breastfeeding was universal, with ever breastfeeding rate as 99.2% and that effort were needed to transform these breastfeeding practices to optimal feeding practices such as EBF which was only 31.9%. The overall status of CF indicators was also comparatively poorer than the breastfeeding indicators; the minimum acceptable diet representing quality and quantity of CF was being attained by only 15.8% children.

Post capacity building, the improved knowledge and perceptions of mothers resulted in better improvement in IYCF core indicators among IG mothers as compared to CG. There was an improvement in 11 of 15 IYCF indicators, in IG, including a significant improvement in EIBF, EBF, age appropriate breastfeeding, Introduction of CF and minimum meal frequency. The average score of 8 core IYCF indicators improved significantly ($p<0.05$) from 39.1% to 52.7% in IG, whereas in CG there was a non-significant decline from 52.7% to 48.9%. Overall, the IYCF core and optional indicators improved in IG by 35.9% and 5.5% respectively, whereas in CG a reduction of around 7% was noted.

Age-wise Trend Analysis of Infant Feeding Practices: The overall age-wise trend analysis of infant feeding practices showed that, compared to baseline, in IG there was a decline in the use of plain water ($p<0.01$) and other milk before 6 months and a concomitant increase in EBF rates. In CG, on the other hand, the age-wise trends in infant feeding practices continued to remain similar to the baseline. In fact, there was a marginal increase in the use of prelacteals, plain water and other milk items.

Integrated Child Development Services Utilization

Growth Monitoring and Promotion: The baseline assessment revealed an incomplete implementation of the GMP activity in field with only 68.5% children U-2 being regularly weighed every month, 16.6% reported plotting on MAMTA card following weight measurement and 5.1% reported plotting on MAMTA card by AWWs. Thus, there was minimal use of GMP as an IPC tool by AWWs, and as a result, only 18.4% parents were aware of their index child's nutritional status.

Post capacity building, the perception of mothers regarding the importance of regular weighing (↑17.5% vs. ↑14.8%) and weighing of children other than during

immunization/health checkup (↑5.5% vs. ↓5.9%) showed better improvement in IG as compared to CG. Further, significant improvement in GMP activities such as recent weighing in the last 30 days (↑21%, p<0.01), plotting on *MAMTA* card after GMP (↑4.3 times, p<0.001), mothers awareness of the child's nutritional status, weight, nutritional grade and grade colour (p<0.001,↑5, ↑2.6, ↑5.1 and ↑11.3 times), were noted in IG as compared to non-significant changes in CG; except about mother's awareness of the child's nutritional status (p<0.001, ↑2.2 times).

Village Health and Nutrition Day (MAMTA DAY): At baseline, only around half of the respondents reported having attended the previous *MAMTA DAY* sessions in their respective areas. Further, the use of MAMTA card by AWWs, as an IPC tool, especially for child care practices was only around 9%. As a result, the mothers referring to (<20%) and understanding (12%) of growth chart, nutritional grades and growth chart curves, from MAMTA card was very low.

Post capacity building, awareness of *MAMTA DAY* (IG 144.8% vs. CG 75.8%) and participation on *MAMTA DAY* (IG 17.7% vs. CG -1.2%) by mothers (of children U-2) improved among IG as compared to CG. The counseling by AWWs using MATMA card, as well as counseling on key IYCF and GMP messages using *MAMTA* card improved significantly (p<0.001) in IG, by 7 to 7.5 times ; as compared to around 1.2 times increase in CG-AWWs. As a result, post capacity building, mothers' understanding of growth chart and IYCF guidelines on *MAMTA* card was significantly (p<0.001) higher among IG by 7.6 and 3.5 times as compared to 1.8 (p<0.001) and 1.4 times in CG respectively.

Awareness and Utilization of Balbhog Supplementation: The baseline assessment reported 72% availability and 69% end-use of *Balbhog* (fortified ready-to-eat food). Although 55% mothers with children 6-23 months, reported counselling about use of *Balbhog* by AWWs, the distribution of *Balbhog* on *MAMTA DAY* was only 3.2%, and none of the mothers reported having received *Balbhog*, after GMP and IYCF counselling. Overall, 40.4% families reported giving *Balbhog* daily (6-7 days/week) and 50% mothers perceived a positive impact of *Balbhog* supplementation on the child's health.

Post capacity building, the distribution of *Balbhog* on *MAMTA DAY* increased significantly (p<0.001) among IG children (6-23 mo.) by 4.6 times as compared to only 1.2 times increase in CG. As a result of reduction in supply of *Balbhog*, no major conclusion could be drawn regarding frequency and household utilization of *Balbhog*. However, despite supply issue, the statistically significant reduction in end use and utilization of *Balbhog* was less in IG, by 4.6% and 4.8%, as compared to, CG.

Nutritional Status of Children Under-Two Years

The overall nutritional status of all children U-2 (n=937) at baseline showed that the prevalence of underweight was the highest (WAZ<-2SD, 48.8%), followed by almost similar prevalence of wasting (WHZ<-2SD, 36.3%), and stunting (HAZ<-2SD, 36.2%). The prevalence of Severe Acute Malnutrition (SAM) among children 6-23 months was 3% using MUAC (MUACZ<-3SD) and 11.7% using weight for height criteria (WHZ<-3SD) respectively.

Sex-wise, the prevalence of undernutrition and severe undernutrition was higher in males as compared to females, except for severe wasting. Sex-wise the prevalence of underweight ($p<0.05$), stunting ($p<0.01$), severe stunting (HAZ<-3SD, $p<0.05$), mean WAZ ($p<0.05$) and HAZ ($p<0.01$) was significantly higher in males as compared to females.

Age-wise the difference in prevalence and mean z-score was significant for all anthropometric indices. Overall, the prevalence of undernutrition was highest among the older children (12-23 mo.) i.e., underweight 58.8%, stunting 48.3%, wasting 40.9%, SAM 20.1% (MUACZ<-3SD) as compared to other age groups, as well as, compared to the overall prevalence within the total population and sex-wise prevalence. Finally, comparing IG and CG, it was observed that, overall the prevalence of undernutrition was more in the IG as compared to the CG despite randomization.

Analyzing the **factors affecting the nutritional status of children U-2**, it was concluded that the children belonging to lower SES or having no access to toilet facility or born to illiterate mothers, had significantly higher odds of being under nourished. A strong association between SES status, caste (ST and SC) and undernutrition was also noted. Sex (male), age (6-11 mo. and 12-23 mo.) and low-birth-weight of children were found to be significantly associated with undernutrition in children.

Overall, with reference to the three **IYCF core indicators**, the differences in prevalence of undernutrition were statistically non-significant for all three undernutrition indicators. The children who did not have EIBF had comparatively higher prevalence and odds of wasting (OR 1.18) and underweight (OR 1.59) as compared to children who had EIBF. EBF did not show any strong association with undernutrition, whereas the age of introduction of CF between 9-18 months showed a marginally higher prevalence and odds of undernutrition as compared to those who were introduced CF between 6-8 months.

Lastly, no association of undernutrition with consumption of *Balbhog* was noted among children 6-23 months. An interesting finding was that the participation of children in monthly GMP showed a positive association with prevalence of

undernutrition. The odds of undernutrition i.e. underweight (OR 1.80), stunting (OR 2.10 p<0.05) and wasting (OR 1.40) was higher among children not weighted for last three or more as compare to those weight within last one month.

Post capacity building, the study showed a protective impact of capacity building on the nutritional status of children (U-2) in IG as compared to CG. There was a significant increase in prevalence of underweight, wasting and MUACZ<-2SD in CG, whereas in IG, only the prevalence of underweight increased significantly. The risk difference analysis showed that IG had 3.4%, 0.89%, 4.51% and 3.71% less underweight, stunted, wasted and SAM children as compared to CG. These positive findings may be attributed to the improved feeding practices observed in the IG as a result of capacity building.

Sex-wise, except for stunting (non-significant increase), undernutrition increased significantly with regard to all the anthropometric indices among CG males as compared to less and non-significant increase among IG males. Among females the mean WHZ and MUACZ score reduced significantly within CG females, as compared to non-significant reduction of MUACZ score and increase of WHZ score in IG females.

Age-wise the protective impact of capacity building was only observed on the prevalence of wasting (RR<1) among IG children 0-5[1] months. Among children 6-11 months, the prevalence of wasting, and MUACZ<-2SD increased significantly in CG, as against the reduction in prevalence of MUACZ<-2SD in IG, which may be a result, of improved CF practices observed in IG. Also, the mean WAZ, WHZ and MUACZ score reduced significantly in CG as compared to non-significant changes in IG. Further, among older children (12-23 mo.), the mean MUACZ values increased significantly among IG (p<0.01) as compared to more significant decline in CG (p<0.001). Overall, except for the prevalence of stunting among 6-11 months children, the risk difference estimates showed lower undernutrition among IG as compared to CG (6-11 mo. and 12-23 mo.). This could again be attributed to improved CF practices among IG mothers.

Also in IG, a protective effect of capacity building on the prevalence of SAM (MUACZ<-3SD) was observed among all children (0-23 mo.), as well as among males, females and children (12-23 mo.) with RR<1, as against an increased risk of developing SAM in CG.

Cluster-wise, 79% clusters (AWCs) in IG (15/19) showed protective effect of capacity building on at least one indicator of undernutrition, as against 59% in CG

[1] Age groups are described in intervals of months completed. For example, infants 0–5 months of age have completed 5 months but are less than 6 months (or 183 days) old.

(10/17). Among all indices, the major difference between the IG and CG was in cluster-wise prevalence of SAM (MUACZ<-3SD, 53% vs. 24%) and MUACZ<-2SD (42% vs. 24%), followed by prevalence of wasting (58% vs. 41%), and stunting (47% vs. 35%) respectively. The least difference between the two groups was in cluster-wise improved prevalence of underweight (26% vs. 18%).

In the **paired cohort**, the impact of capacity building was noted on the prevalence of wasting and MUACZ<-2SD. The fall in MUACZ<-2SD was 4 times in CG as compared to IG, showing a protective effect of capacity building on IG in paired cohort.

Finally, the two **follow-ups of children born to the pregnant women cohort, enrolled at baseline,** showed higher prevalence of underweight (7.1% and 8.3%) and wasting (15.6% and 9.4%), among CG as compared to IG children during 1st and 2nd follow-up respectively, whereas, stunting was greater among IG by 11.6% and 6.3% points, as compared to CG children. Similar to the 1st follow-up, except for stunting, the overall and sex-wise nutritional status of IG was better than CG.

Conclusions

Thus, from the entire study, it can be concluded that regular trainings with reinforced on-job capacity buildings and follow-ups of capacity buildings has the potential to bring about discretion among the change agents (AWWs), between simply passing on IEC messages to the community and the science behind “bring about behavior change”, in the community. Resulting into improvement in community based IYCF practices as well as the prevention of undernutrition and reduction of SAM in the community.

CHAPTER 1: INTRODUCTION

Globally, undernutrition contributes to nearly 35%, i.e. three million deaths of children under five years of age (Black *et al.* 2008). The National Family Health Survey (NHFS) – 3, 2005-06 shows that 40.4% of children under three years of age are underweight in India (NFHS-3 2007).

Child malnutrition is mostly the result of inappropriate infant and young child feeding and caring practices, and has its origins almost entirely in the first two years of life (Shrimpton *et al.* 2001). It has been established that early childhood nutrition is the single most important child survival intervention (Bhutta *et al.* 2008). Of the available interventions, counseling on breastfeeding has the greatest potential to reduce the burden of childhood morbidity and mortality. Also, improvement of complementary feeding practices through strategies, such as counseling about nutrition for food-secure populations could substantially reduce stunting and related burden of disease (Bhutta *et al.* 2008).

The national guidelines on infant and young child feeding practices (IYCF) recommends; early initiation of breastfeeding (EIBF) within 1 hour of birth, exclusive breastfeeding (EBF) for the first six month of life, followed by continued breastfeeding for up to 2 years and beyond with adequate complementary food, as the most appropriate feeding strategy for infants and young children (Tiwari *et al.* 2010). Translating the optimal IYCF practices to coverage of 90% is estimated to contribute to 19% reduction in the deaths of children under five years i.e., saving about 450,000 under five years deaths in a country like India (Jones *et al.* 2003, BPNI Bulletin 2006).

The 11th Five-Year Plan vision for malnutrition reduction also incorporates, improving home child care practices, including IYCF and care practices for newborns through enhanced EIBF, EBF and complementary feeding (CF) (GOI 2007).

The persistent high levels of child undernutrition in India are the consequences of a complex interaction of basic, underlying and immediate factors as given in the theoretical frameworks of Mosley and Chen (1984) and UNICEF (1990). While any single intervention cannot address such a complexity of determinants, India depends heavily on the package of services provided by Integrated Child Development Services (ICDS) to address the immediate causes of undernutrition, namely, inadequate dietary intake and childhood infection. ICDS is thus, a well designed intervention and is an appropriate response to the problem of undernutrition in India (Gragnolati *et al.* 2006).

India's Integrated Child Development Services (ICDS) programme was established in 1975 and is the world's largest early child development programme. The programme approaches child health holistically and comprises health, nutrition, and education components for pregnant women, lactating mothers, and children under-six years of age. The programme is implemented through a network of community-level *Anganwadi* centers. The range of services targeted at young children and their mothers include growth monitoring, immunization, health check-ups, and supplementary feeding, as well as nutrition and health education to improve the childcare and feeding practices that mothers adopt. Preschool education is provided to children between three and six years of age (http://wcd.nic.in/icds.htm).

Promotion of community based optimal IYCF practices is one of the components of the ICDS programme in India, in which the ICDS *Anganwadi* workers (AWWs) and their Supervisors, need to play a vital role.

Further, globally and especially in India, Growth Monitoring and Promotion (GMP) is widely used as a community based tool for child survival. The use of growth monitoring extends beyond problem detection; it has been used to provide a basis for communicating with mothers on child health and nutrition by stimulating the thinking about the causes of poor growth and malnutrition (ACC/SCN 1990a).

Growth monitoring (GM) is the process of tracking the growth rate of a child in comparison to a standard by periodic anthropometric measurements in order to assess growth adequacy and identify faltering at early stages. Assessing growth at regular intervals allows capturing growth faltering before the child reaches the status of undernutrition and makes it possible to take quick corrective action (UNICEF 2008).

GMP is a prevention activity that uses growth monitoring, i.e. measuring and interpreting growth, to facilitate communication and interaction with caregivers and to generate adequate action to promote child growth (UNICEF 2007a).

Conceptually, effective GMP program should ensure early detection of growth faltering, appropriate counseling and increase contact with health services leading to improved nutritional status and reduced morbidity and mortality (UNICEF 2008). The quality of implementation of GMP depends on five main activities linked with it which are (1) weighing accurately; (2) plotting on a growth chart; (3) interpreting the growth curve; (4) discussing options with the caregivers and agreeing on future action; and (5) evaluating the child's response (Ashworth *et al.* 2008). This process must include the active engagement of the caregiver in problem-solving about the child's growth. These conditions can best be met in the community setting, and have the best

opportunity for producing results at a public health level if they reach all children in the age group of 0-24 months (mo.) in a defined catchment area. GMP sessions should be linked to other health services in community and be designed to have an effective system in place to refer children to health services when needed. The GMP process may also be possible in a clinic setting (UNICEF 2007a).

The objective of GMP is to determine inadequate growth early enough and under take actions to prevent further faltering before the child reaches a status of undernutrition; hence it is primarily a preventive and promotive activity. The expected outcomes of GMP are (UNICEF 2007a):

- Heightened awareness of the importance of caregiver practices for adequate growth and the link between adequate growth and child health
- Increased knowledge and skills and subsequent improved child feeding and health care practices by caregivers
- Increased coverage of particular health services, if they are offered along with it
- Improved care-seeking/utilization of services when these are promoted/supported through the GMP counseling.

However, it is important to note that child anthropometric measurements for assessing nutritional status are not GM or GMP. Periodic measurements at appropriate intervals are crucial to the GMP concept and assessment of nutritional status even at a quarterly or biannual rate does not have the ability to capture growth faltering and prevent undernutrition. GM and GMP thus should not be considered a surveillance, or just to be merely used to determine levels of undernutrition to decide on eligibility for the correction of poor nutritional status (e.g. food supplementation, therapeutic feeding, etc). When GM information is not used to inform the education and promotion element of an intervention then it is not GMP; both the monitoring of growth and using that growth information in counseling are essential to GMP. It is important to emphasize that the GMP periodic measurements and counseling are primarily considered as preventive activity ensuring that the growth faltering is caught early enough so as not to reach the status of undernutrition. However, the framework of GMP may catch also children at different stages of undernutrition and refer to relevant services for additional interventions (UNICEF 2007a).

GMP alone is not a program or comprehensive intervention to address established undernutrition, but is an important activity that can be built on to become a basis for comprehensive community nutrition interventions and programs based on thorough causal analysis of undernutrition. In order to reduce undernutrition rates in the community, these community nutrition programs could be designed with GMP as an

entry-point or platform and as a continuous monitoring tool. Thus, GMP will continue to serve as a preventive and promotional measure, and will facilitate the building of a community nutrition program. In addressing the full spectrum of malnutrition (i.e. under- and over-nutrition), the role of GMP in capturing over-nutrition especially through the use of new WHO standards needs to be further explored (UNICEF 2007a).

Even though simple in concept there are abundant difficulties with GMP and, as a result only 20% (35/178) countries contacted in 1998–2000 reported having no problems with the use of growth charts (de Onis *et al.* 2004), which is similar to the proportion (22%) reported in 1978 among health personnel contacted in 50 countries (O'Brien 1978).

The GMP issues with ICDS of India are no different than this. Incorrect weighing and plotting (Kapil *et al.* 1996), failure to identify children with growth faltering and lack of nutrition counseling have been reported (Gopaldas 1988, Lalitha and Standley 1988 and Gopaldas *et al.* 1990) resulting in no impact on weight for age or morbidity (Kapil *et al.* 1996, Lalitha and Standley 1988).

Studies of various GMP programs have shown that inadequate training of health workers; especially in equipping and enabling them to provide effective counseling have been identified as a very important contributing factor to poor quality of implementation (Karim *et al.* 1994, Kapil *et al.* 1996, Marek *et al.* 1999)

To be effective in reducing child malnutrition and mortality, GMP (Ashworth *et al.* 2008);

- Must be accompanied by community-based health and nutrition interventions
- Should prioritize infants and children aged 0-18 months.
- Utilize all child health contacts for nutrition counseling
- Improve training, supervision and support for health workers.

The impact of any program is dependent on coverage, intensity of contact, frontline worker performance, and adequacy of resources. Training, supervision and support for workers must be improved if they are to be effective counselors in growth promotion programme (Ashworth *et al.* 2008).

The 11th Five-Year Plan recommends, weighing of all children under-three years at the *Anganwadi* centre (AWC) and counselling their mothers as a key coverage, as well as service quality indicator (GOI 2007).

Although ICDS coverage is fairly high, from the 84% of children under-six years in Gujarat who are in areas covered by an *Anganwadi* centre, a little more than two-fifth (44%) receive services of some kind from a centre (NFHS-3 Gujarat 2008).

Also, the current ICDS training system appears to be quite divorced from field reality and practitioner experience. Building more lively and effective training programmes, linked with ground realities, would require building crucial linkages between training, programme implementation and review, and child development knowledge and practice" (GOI 2007).

In Gujarat, the prevalence of 41.1% underweight, 49.2% stunting and 19.7% wasting, among children under-three years, clearly indicates that the poor feeding practices is the primary reason for the high level of malnutrition (NFHS-3 2007). As per the District Level Household and Facility Survey (DLHS) – 3, 2007-08 for Gujarat, only 19.5% children 6-24 months met all the three criteria of optimal IYCF feeding i.e. children 6-24 mo. who were, breastfed within 1 hour of birth, exclusively breastfed for six months, and presently receiving solid and semi-solid food (DLHS-3 2010).

As a result, in the year 2007, for converging the services of ICDS and RCH under one umbrella, the strategy of *MAMTA Abhiyan* was launched by the Government of Gujarat with additional focus on:

- universal coverage for growth monitoring and promotion for children,
- preventive health services to women and children
- nutrition counseling and follow-up of children with faltering growth

MAMTA Divas, also known *as* "Village Health and Nutrition Day", is the key activity of *MAMTA Abhiyan* which is observed on the fixed day of immunization sessions across the state. The major focus of *MAMTA DAY* (Village Health and Nutrition Day - VHND) is GMP and counseling on IYCF practices which are expected to bring about change in the IYCF practices of parents and caregivers and eventually prevention and reduction in malnutrition.

Previous studies have shown that effective educational interventions such as group training, individual counselling and interpersonal communication can change caretakers' feeding behaviors, thereby enhancing children's dietary intake and growth (Guldan *et al.* 2000, Salehi *et al.* 2004, Kilaru *et al.* 2005, Penny *et al.* 2005, Roy *et al.* 2005).

A search of the literature, however, showed that there is dearth of data on the role ICDS can play in promoting and improving appropriate IYCF practices. As mentioned earlier, appropriate IYCF practices can play a key role in reducing undernutrition. A key function of the ICDS AWWs is imparting Nutrition Health Education and counseling the mothers of young children on feeding practices and was envisaged as a key component of *MAMTA DAY*. However, how well equipped are the ICDS AWWs in carrying out this function needs to be studied and also the impact that that building

their capacities on this aspect has on improved IYCF practices and undernutrition at community level needs to be assessed. In view of this, an interventional operational research study was undertaken in semi tribal Vadodara with the aim to answer the following research question

Whether capacity building of ICDS functionaries, on growth monitoring and promotion, and infant and young child feeding practices, can bring about a required change in the infant and young child feeding practices of parents and care providers, and eventually a reduction in undernutrition among children under two years of age?

The broad objectives of the study were:

- To build the capacity of *Anganwadi* workers of ICDS scheme on growth monitoring and promotion, and infant and young child feeding, and to assess its impact on infant and young child feeding practices and nutritional status of children under two years.

Specific Objectives:

1. To assess the knowledge and perceptions of *Anganwadi* workers with regard to growth monitoring and promotion and infant and young child feeding practices, among selected rural *Anganwadi* centers' of Vadodara district.
2. To assess the prevalence of undernutrition and associated IYCF practices of care providers of children under two years.
3. To build the capacity of *Anganwadi* workers' on growth monitoring and promotion and infant and young child feeding in two stages:
    a. Formal Capacity Building – Group training
    b. Hands-on Capacity Building – Individual on-the-job training
4. To assess the impact of capacity building on knowledge and perceptions of *Anganwadi* workers' with regard to growth monitoring and promotion, and infant and young child feeding practices.
5. To assess impact of capacity building on undernutrition prevalence and associated infant and young child feeding practices of care providers of children under two years.

CHAPTER 2: REVIEW OF LITERATURE

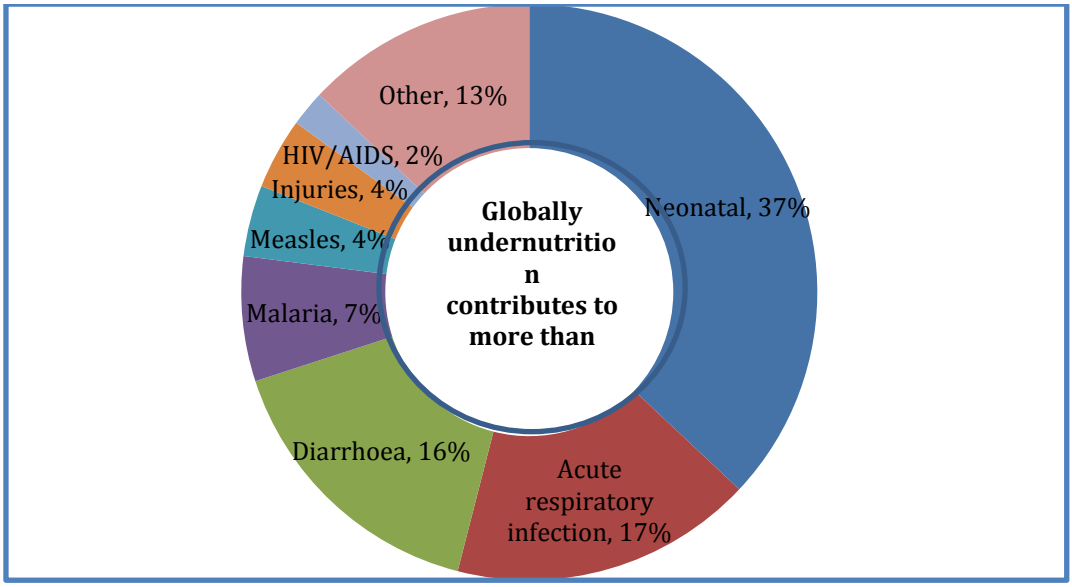
This chapter presents the literature reviewed in the area of undernutrition with special focus on children under two years, Optimal Infant and Young Child Feeding Practices, Growth Monitoring and Promotion and its role in prevention and cure of undernutrition and lastly national programs for prevention of undernutrition with special focused role of ICDS and their front line *Anganwadi* Workers (AWWs). The review is presented under the following heads:

A. Child Survival and Nutrition

1. Global Scenario

Approximately 10.8 million children under five years of age die each year globally, out of which 3.9 million are neonates. Further, as presented in Figure 1 the estimates for 2000 show that 38% of all deaths in children younger than age 5 years happen in the first month of life (Zupan and Aahman 2005). Two-thirds of infant deaths, i.e., about 120 million infants die during the first two months of life.

Figure 1: Causes of Mortality in Children under 5 years (2004)



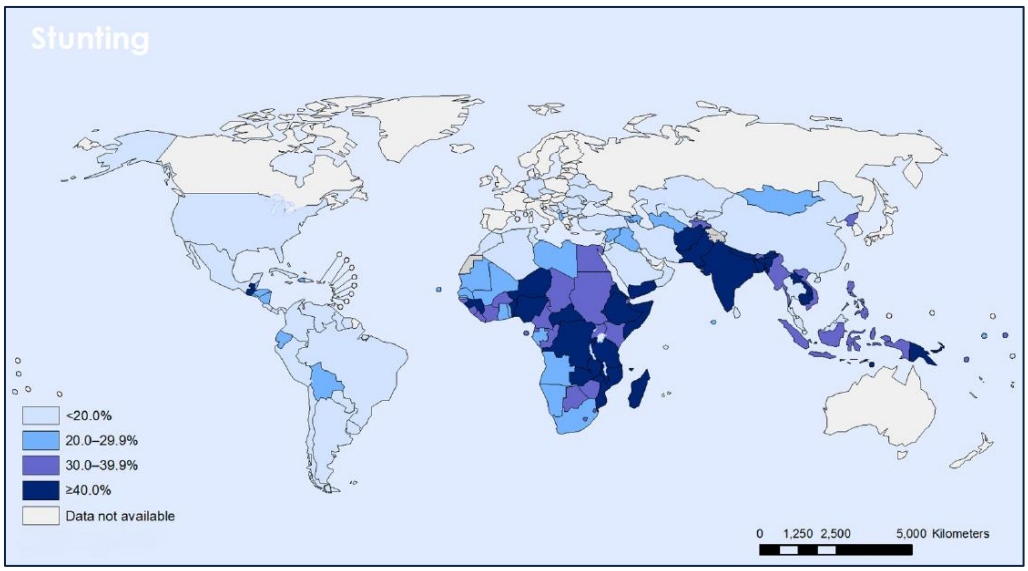
***Source**:* Black *et al.* 2008

In 2009, UNICEF reported 195 million stunted, 129 million underweight and 13% children under-five years as wasted in developing world (UNCIEF 2009). Although the prevalence's of stunting and underweight among children under-five years of age worldwide have decreased since 1990, overall progress is insufficient and millions of children remain at risk. Globally, more than one quarter (26%) of children under 5

years of age were stunted in 2011 – roughly 165 million children worldwide (Figure 2). Further, an estimated 101 million children under 5 years of age were underweight, or approximately 16% of children under 5 (Figure 3). The children who suffer from wasting face a markedly increased risk of death. According to the latest available data, 52 million or 8% children under 5 years of age were moderately or severely wasted (Figure 4) and more than 29 million children under 5, an estimated 5%, suffered from severe wasting (UNICEF/WHO/WB 2012).

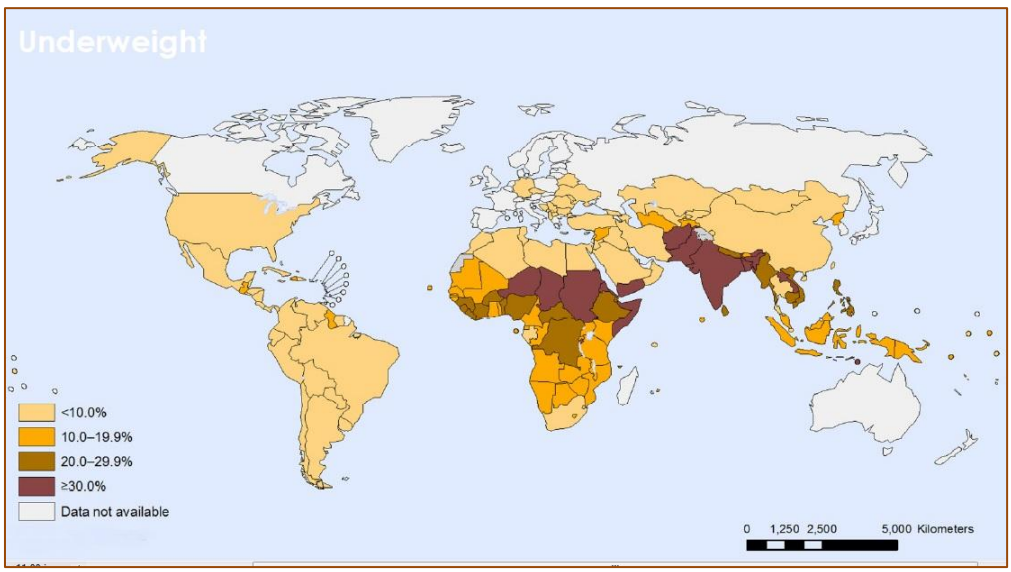
Figure 2: Global Prevalence of Stunting: Percentage of Children under-5 years who are moderately or severely stunted

Stunting prevalence is highest in sub-Saharan Africa and South Asia



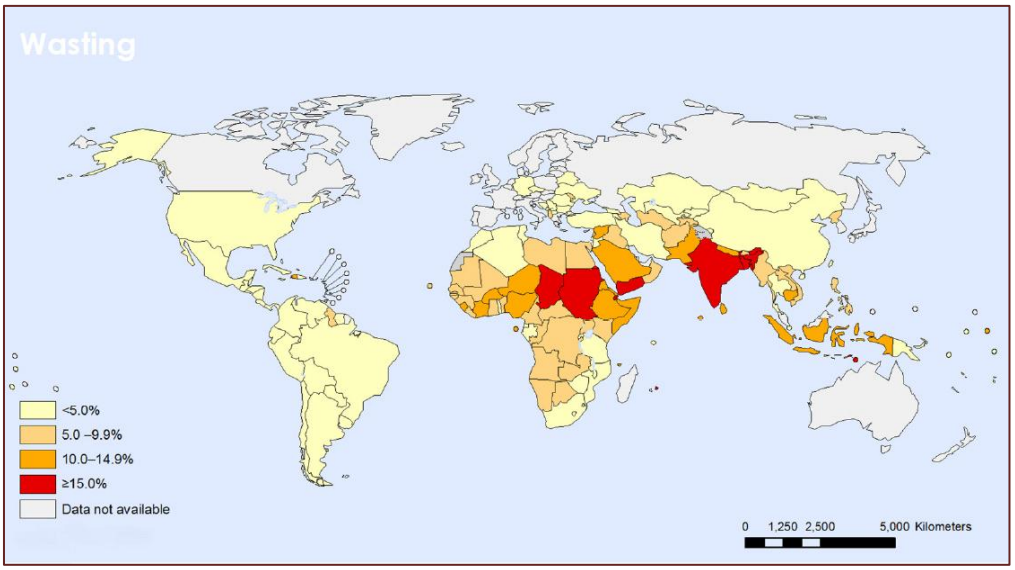
Source: UNCIEF/WHO/WB 2012

Figure 3: Underweight Prevalence: Percentage of Children under-5 years old who are moderately or severely underweight



Source: UNCIEF/WHO/WB 2012

Figure 4 : Wasting Prevalence: Percentage of Children under-5 years old who are moderately or severely wasted



Source: UNCIEF/WHO/WB 2012

As a result globally, undernutrition contributes to nearly 35% i.e. three million deaths of children below five years of age (Black *et al.* 2008). Undernourished children who survive may become locked in a cycle of recurring illness and faltering growth, with irreversible damage to their development and cognitive abilities (Black *et al.* 2008). Malnutrition can start before birth and can persist throughout life. Many babies are born with low birth weight and micronutrient deficiencies. An estimated 3,564 of the world's children under 5 years of age die each day (1,301,000 each year*) from causes that are preventable by optimal breastfeeding. In addition, for every child who dies, hundreds of others are sick and miserable from illnesses preventable with optimal breastfeeding. These children are the world's future (Jones *et al.* 2003). Poor feeding practice during the first 2 years of life have immediate and often long term negative consequences on growth and development (AED 1999).

Shrimpton *et al.* 2001 showed that the mean weights start to falter at about 3 months of age and decline rapidly until about 12 months, with a markedly slower decline until about 18 to 19 months and a catch-up pattern after that. Growth faltering in weight for length/height is restricted to the first 15 months of life, followed by rapid improvement. For length/height for age faltering starts immediately afterward, lasting well into the third year. Thus they concluded that undernutrition patterns are similar globally. Most undernutrition happens in the first 2 years of life. After that it tracks at the same level. And much of this early damage is irreversible. Thus targeting children

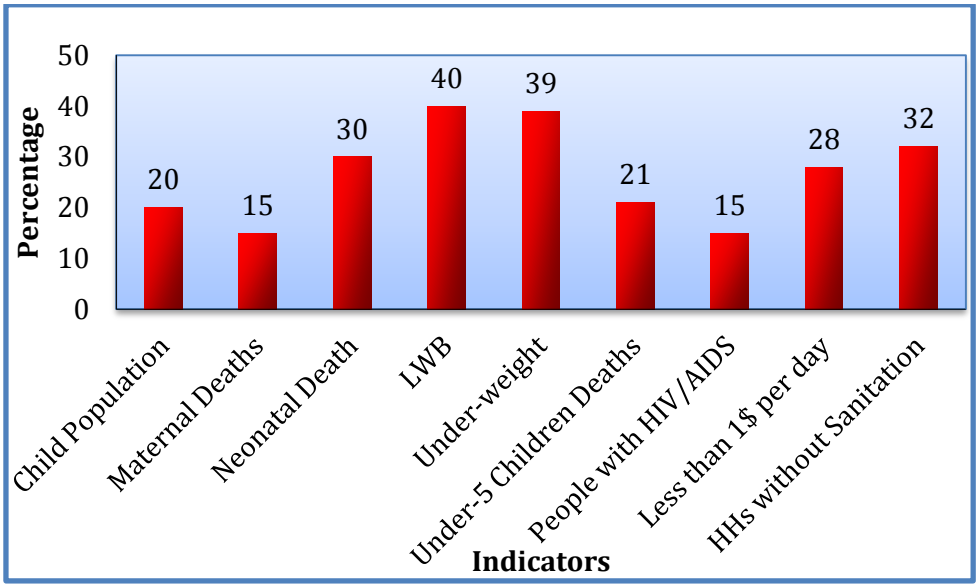
either before birth or in the first 2 years of life is the **"*WINDOW OF OPPORTUNITY*"** to have an impact on undernutrition.

Further in 2010, Victora and Shrimpton *et al.* describing worldwide growth-faltering patterns by using the new World Health Organization (WHO) standards concluded that, the comparison of child growth patterns in 54 countries with WHO standards shows that growth faltering in early childhood is even more pronounced than suggested by previous analysis based on the National Center for Health Statistics reference. These findings confirm the need to scale up interventions during the window of opportunity defined by pregnancy and the first 2 years of life, including prevention of low birth weight and appropriate infant feeding practices.

2. Indian Scenario

Approximately 20% (Figure 5) of the world's children are in India and yet there is disproportionate share of human development problems including a very high maternal and under 5 mortality (UNICEF 2007b).

Figure 5 : India's Share of the Global Challenge



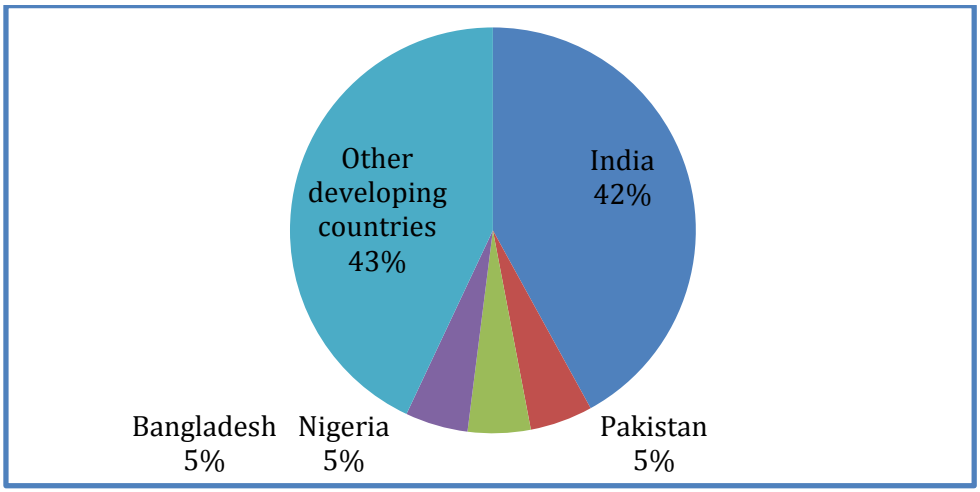
***Source**: UNICEF 2007b. Countries with the largest numbers of children under five who are moderately or severely underweight, as a proportion of the developing world total (129 million children)*

As mentioned in Figure 6, the prevalence of underweight among children is higher in Asia than in Africa. The rates are highest in Bangladesh, India, Timor-Leste and Yemen, with more than 40% of children underweight (UNICEF 2009).

The last National Family Health Survey-3 (NHFS-3) 2005-06 survey showed very high levels of malnutrition in India. As per NFHS-3, in India almost half of children under 5 years (48%) are stunted and 43% are underweight. Further, among children

under 3 years, 40.4% of children are underweight and 16% children are severely underweight and 22% are severely stunted (NFHS-3 2007). The NFHS-3 data for the state of Gujarat shows, 49.2% children under three years are stunted reflecting failure to receive adequate nutrition over a long period of time and also recurrent and chronic illnesses (NFHS-3 Gujarat 2008).

Figure 6 : Contribution to the Underweight Burden



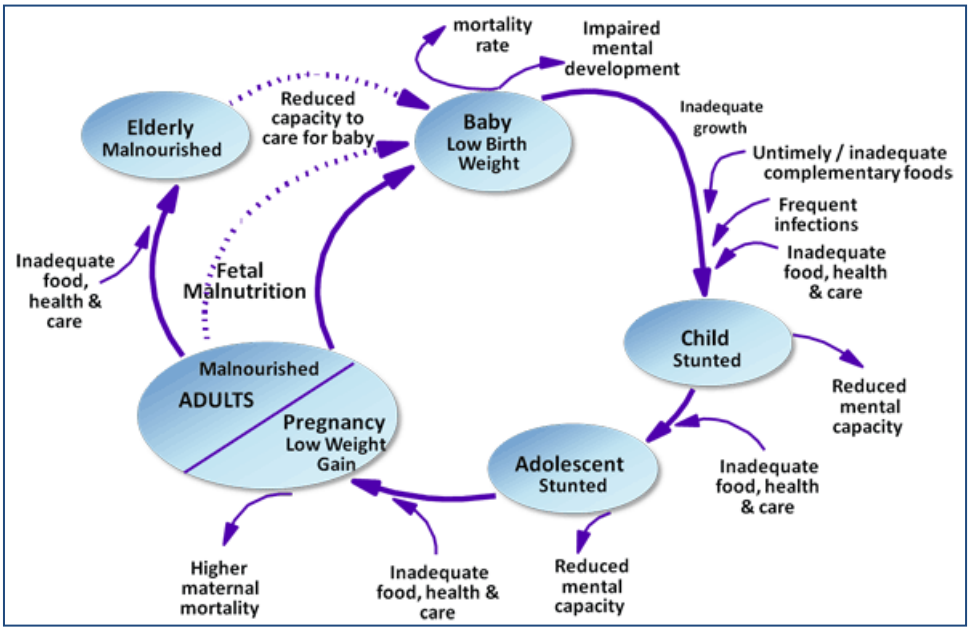
***Note**: Estimates are calculated using underweight prevalence according to the WHO Child Growth Standards and the number of children under 5 years old in 2008. Underweight prevalence estimates are based on data collected in 2003 or later with the exception of Pakistan (2001-2002). Source: UNICEF 2009 from MICS, DHS and other national surveys, 2003-2008*

3. Etiology of Undernutrition

Undernutrition often starts *in utero* and may extend throughout the life cycle. It also spans generations. Undernutrition occurs during pregnancy, childhood, and adolescence, and has a cumulative negative impact on the birth weight of future babies (Figure 7). A baby who has suffered intrauterine growth retardation (IUGR) as a foetus, is effectively born malnourished, and has a much higher risk of dying in infancy. Survivors are unlikely to catch up significantly on this lost growth and are more likely to experience developmental deficits. Moreover, the consequences of being born malnourished extend into adulthood. Strong epidemiological evidence suggests a link between maternal and early childhood undernutrition and increased adult risk of various chronic diseases.

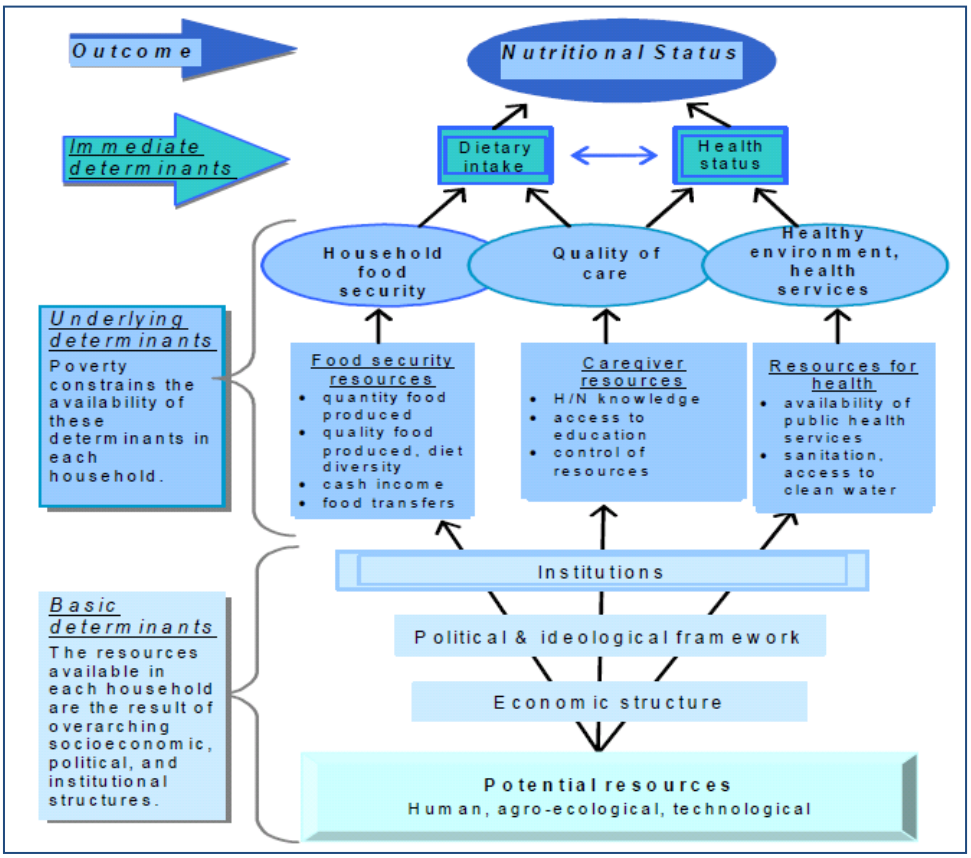
According to UNICEF (1990) the synergistic interaction between the two immediate causes (inadequate dietary intake and disease) fuels a vicious cycle that accounts for much of the high morbidity and mortality in developing countries (Figure 8). The three groups of underlying factors are household food insecurity, inadequate maternal and child care, and poor health services in an unhealthy environment.

Figure 7 : Undernutrition throughout the life cycle



***Source**: Adapted from ACC/SCN (2000) Fourth Report on the World Nutrition Situation. Geneva: ACC/SCN in collaboration with the International Food Policy Research Institute.*

Figure 8 : Conceptual Framework: The Cause of Undernutrition



***Source**: Adapted from UNICEF 1990, Jonsson 1993, Smith and Haddad 2000*

The link of inappropriate feeding practices and malnutrition has been long recognized and is a matter of serious concern. It has been suggested that the high prevalence

rate of malnutrition among young children in India is not primarily caused by poverty, but rather relate to faulty infant feeding practices. Delayed initiation of breastfeeding, pre lacteal feeds, early introduction of top feeds and untimely and inadequate introduction of complementary feeds all lead to malnutrition (Ghosh 1997). Faulty feeding practices contribute to malnutrition through loss of breast milk and essential nutrients, infections and depriving the baby of care and stimulation. Such a situation calls for action and improving infant feeding practices offers one of the most practical solutions to help reduce malnutrition among young children (Gupta 2000).

4. Consequences of Undernutrition

The effect of undernutrition on young children (ages 0-8) can be devastating and enduring. It can impede behavioral and cognitive development, educability, and reproductive health, thereby undermining future work productivity. Malnourished children have delayed milestones and impaired cognitive development and are likely to be handicapped for life if an innovative approach is not adapted. Thus malnutrition impairs intelligence, strength, energy and productivity. A study by Government of India has established that the annual loss of productivity on account of malnutrition is of the order of more than Rs. 33,000 crores (BPNI and UNICEF 2003).

Therefore, improvement in young children's nutrition is desirable, not only for their expected positive impact on their physical growth, but also to reduce the risk and complications of infections and to maximize psychomotor development and school performance. Hence, appropriate feeding of children under two years is crucial for promoting health and preventing malnutrition (WHO 1995).

B. Optimal Infant and Young Child Feeding Practices

The UNICEF WHO Global strategy for Infant and Young Child Feeding, 2003 recommends:

- ✓ Initiation of breastfeeding immediately after birth, preferably within one hour.
- ✓ Exclusive breastfeeding for the first six months i.e., the infant receives only breast milk and nothing else, no other milk, food, drink or water.
- ✓ Appropriate and adequate complementary feeding from six months of age while continuing breastfeeding.
- ✓ Continued breastfeeding upto the age of two years or beyond.

The national guidelines on infant and young child feeding practices (IYCF) recommends; early initiation of breastfeeding (EIBF) within 1 hour of birth, exclusive breastfeeding (EBF) for the first six months of life, followed by continued breastfeeding for upto 2 years and beyond with adequate complementary food, as

the most appropriate feeding strategy for infants and young children (Tiwari *et al.* 2010). Translating the optimal IYCF practices to coverage of 90% is estimated to contribute to 19% reduction in the deaths of children under five years i.e., saving about 450,000 under five deaths in a country like India (Jones *et al.* 2003; BPNI Bulletin 2006). Therefore one of the fundamental priorities for improving the health and nutritional status of a child should be to achieve optimal feeding and caring practices for the child.

1. National Policy

The tenth five year plan has set specific nutrition goals for infant and young child feeding indicators with a view to bringing down the prevalence of underweight in children. Similarly, goals have been set for enhancing the infant feeding practices in the community. Even in 11th five year plan IYCF activities are under priority.

The National Nutrition Policy adopted by the Government of India (GOI) under the aegis of the Department of Women and Child Development (DWCD) in 1993 laid due emphasis on nutrition and health education of mothers on IYCF and efforts to trigger appropriate behavioral changes among mothers were considered as direct interventions for reducing malnutrition in children.

Now with the adoption of the Global Strategy on IYCF by the 55th World Health Assembly in May 2002, and adoption of the Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Amendment Act, 2003 by the Parliament in June 2003, the National guidelines on IYCF have been published by Ministry of HRD, DWCD, Food and Nutrition Board and GOI in 2004 and 2005 with following objectives:

- ✓ To advocate the cause of infant and young child nutrition and its improvement through optimal feeding practices nationwide,
- ✓ To disseminate widely the correct norms of breast-feeding and complementary feeding from policy making level to the public at large in different parts of the country in regional languages,
- ✓ To help plan efforts for raising awareness and increasing commitment of the concerned sectors of the Government, national organizations and professional groups for achieving optimal feeding practices for infants and young children,
- ✓ To achieve the national goals for IYCF practices set by the Planning Commission for the Tenth Five Year Plan so as to achieve reduction in malnutrition levels in children.

2. Optimal Breastfeeding

Breastfeeding is the normal way of providing young infants with the nutrients they need for healthy growth and development. Virtually all mothers can breastfeed, provided they have accurate information, and the support of their family, the health care system and society at large.

Breastfeeding has been traditionally accepted among Indian women since long and its usefulness has been realized in India for more than 2000 years. This has been mentioned in *Charak Samhita*.

Breastfeeding is an extension of maternal protection that transitions the young infant from the shelter of the in utero environment to life in the ex utero world with its variety of potentially harmful exposures. The promotion, protection, and support of breastfeeding are an exceptionally cost-effective strategy for improving child survival and reducing the burden of childhood disease, particularly in developing countries (Horton *et al.* 1996, Morrow *et al.* 1999, Sikorski *et al.* 2002, Black *et al.* 2003, Jones *et al.* 2003).

Scientific evidence has guided the development of international recommendations for optimal infant feeding practices, which include EBF for 6 months (breast milk only with no other liquids or foods given) and continued breastfeeding upto 2 years of age or beyond with timely addition of appropriate complementary foods. These recommendations were adopted following a systematic review of current scientific evidence on the optimal duration of EBF and an expert consultation on the subject (Butte *et al.* 2002, Kramer and Kakuma 2002, WHO, 2002). They are also included in

UNICEF's Facts for Life "Key Messages: What every family and community has a right to know about breastfeeding (UNICEF 2002)

- Breast milk alone is the only food and drink an infant needs for the first six months. No other food or drink, not even water, is usually needed during this period.
- There is a risk that a woman infected with HIV can pass the disease on to her infant through breastfeeding. Women who are infected or suspect that they may be infected should consult a trained health worker for testing, counselling and advice on how to reduce the risk of infecting the child.
- Newborn babies should be kept close to their mothers and begin breastfeeding within one hour of birth.
- Frequent breastfeeding causes more milk to be produced. Almost every mother's can breastfeed successfully.
- Breastfeeding helps protect babies and young children against dangerous

illnesses. It also creates a special bond between mother and child.

- Bottle-feeding can lead to illness and death. If a woman cannot breastfeed her infant, the baby should be fed breast milk or a breast milk substitute from an ordinary clean cup.
- From the age of six months, babies need a variety of additional foods, but breastfeeding should continue through the child's second year and beyond.
- A woman employed away from her home can continue to breastfeed her child if she breastfeeds as often as possible when she is with the infant.
- Exclusive breastfeeding can give a woman more than 98% protection against pregnancy for six months after giving birth but only if her menstrual periods have not resumed, if her baby breastfeeds frequently day and night, and if the baby is not given any other food or drinks, or a pacifier or dummy.

Compliance with these recommendations has significant child health and nutritional benefits. The Bellagio Child Survival Study Group has identified optimal breastfeeding in the first year of life as one of the most important strategies for improving child survival (Black *et al.* 2003, Jones *et al.* 2003). Increasing optimal breastfeeding practices could save as many as 1.5 million infant lives every year; given the significant protection that breastfeeding provides infants against diarrheal disease, pneumonia, and neonatal sepsis (UNICEF 2002, Black *et al.* 2003, Jones *et al.* 2003). Improved breastfeeding practice can also have a positive effect on birth-spacing, which contributes to child survival (Labbok *et al.* 1997, Jones *et al.* 2003). Further, population-based studies in a number of developing countries have shown that the greatest risk of nutritional deficiency and growth retardation occurs in children between 3 and 15 months of age, associated with poor breastfeeding and complementary feeding practices (Shrimpton *et al.* 2001).

Benefits of breastfeeding for the infant

- **Provides Optimal nutrition**

Breast milk provides superior nutrition for optimum growth - Breast milk provides high quality nutrients that are easily digested and efficiently used by the baby's body. Breast milk is a dynamic fluid that changes to meet the infant's needs. Milk composition is influenced by the gestational age of the infant (preterm milk is different from full-term milk), stage of lactation (colostrum differs from transitional and mature milk, which continues to change as time goes by), and time frame of the feed (foremilk differs from hind milk, which has a higher fat content).

Further breast milk p**rovides adequate water for hydration -** Breast milk also

provides all the water a baby needs. There is no need for any additional liquid. Numerous studies indicate that, for infants' breastfed exclusively and on demand, the water in the breast milk exceeds water requirements. The solute levels in the urine and blood of these infants – even those living in very hot, dry climates -- were within normal ranges, indicating adequate water intake.

Colostrum has special properties and is very important to the infant for a variety of developmental, digestive, and protective factors.

Breast milk is normally the only food that infants need for the first 6 months of life. Safe and appropriate complementary foods should be given from the sixth month of life while breastfeeding continues. Breast milk continues to be an important source of energy and high quality nutrients through the second year of life and beyond.

- **Protective Effect of Breastfeeding on Infant Morbidity**

Breast milk is a living fluid that protects the baby against infection. During the first year of a baby's life, because the immune system is not fully developed, the baby depends on mother's milk to fight infections.

As presented in Table 1 breastfeeding reduces the risk of diarrhoes, respiratory infections and otitis media. Breastfeeding also has a protective effect on infant mortality specially related to diarrhoes and respiratory infections. It is generally agreed that allergies are less common in completely breastfed babies.

Table 1: Protective Effect of Breastfeeding on Infant Morbidity

Place *and* Reference	N	Findings
Reduced risk of diarrhoea		
Philippines (Popkin *et al.* 1990)	3000 mother and infant pair	Artificially fed babies were upto 17 times more at risk of getting diarrhoea than EBF.
Dundee, Scotland (Howie *et al.* 1990)	750 mother and infant pair.	Between 0 and 13 weeks of age, almost 20% of bottle-fed infants had diarrhoea as compared to only 3.6% of the breastfed infants.
United States (Scariati *et al.* 1997)	1874 mother and infant pairs	Compared to non-breastfed infants, breastfeeding showed a protective effect against diarrhoeal disease (OR 1.8).
Reduced risk of respiratory infection		
Dundee, Scotland (Howie *et al.* 1990)	750 mother and infant pair	Between 0 and 13 weeks of age, almost 39% of the bottle-fed infants had respiratory illness compared to only 23% of the breastfed infants.
Reduced risk of otitis media		
Sweden *(Aniansson et al.*	400 New born	At one to three mo., 6% of the weaned infants had otitis media, compared to only 1% of the

Place *and* Reference	N	Findings
1994)		breastfed infants.
United States (Scariati *et al.* 1997)	1743 mother infant pairs	Study found a protective effect against otitis media if infants were breastfed as compared to infants who were not breastfed. The risk diminished the more breast milk the infant drank (a dose response).
Protective effects of breastfeeding on infant mortality		
Diarrhoeal disease and respiratory infections		
Latin America (Betran *et al.* 2001)		Artificially-fed infants 0-3 mo., were over 14 times more likely to die of diarrhoeal disease and 4 times more likely to die of acute respiratory infections than EBF. Artificially-fed infants' 4-11 mo., were almost 2 times more likely to die of both diarrhoeal disease and acute respiratory infection than partially breastfed infants.
Breastfeeding reduces the risk of chronic disease		
Lower risk of allergies		
Sweden (Kull *et al.* 2002)	4089 infant	EBF prevented children from having multiple allergic disease (OR (adj) = 0.7, 95% CI 0.5 to 0.9) during the first 2 years of life.
Lower risk of Obesity		
Germany (Von *et al.* 1999)	9357 Children aged 5 and 6	After adjusting for potential confounding factors, breastfeeding remained a significant protective factor against the development of obesity (odds ratio 0.75, 95% CI 0.57 to 0.98) and being overweight (0.79, 0.68 to 0.93).

- **Breastfeeding has psychosocial and developmental benefits**

Breastfeeding helps mother and baby to bond. Close contact right after delivery promotes development of a loving relationship between mother and baby. Babies cry less and mothers respond better to their babies' needs.

The effects of breastfeeding and breast milk on infant and child development and IQ has been a subject of much interest in the scientific field and the findings over decades of research have found consistently better developmental outcomes and higher IQs if breastfed (Fergusson *et al.* 1982).

Long term study in Copenhagen found that duration of breastfeeding was associated with significantly higher IQ scores at 27.2 years. This study also found a positive dose effect (Mortensen *et al.* 2002).

Benefits of breastfeeding for the mother

- **Breastfeeding protects mother's health**

The oxytocin released during breastfeeding helps the uterus to return to its previous size and helps to reduce postpartum bleeding. Early breastfeeding has a physiological effect on the uterus as well, causing it to contract. This action would also be useful for reduction in postpartum bleeding in women. Oxytocin is known to play a role in bonding and reduction in postpartum bleeding; it has been demonstrated that oxytocin levels increase during first 45 minutes and return to normal levels in 60 minutes (Nissen *et al.* 1995). It was found that suckling and hand touching by babies stimulates oxytocin release, which is significant for uterine contractions, milk ejection and mother infant relationship (Matthiesen *et al.* 2001). Another study (Sobhy and Mohame 2004) demonstrated that early vs. late initiation was related to less vaginal bleeding postpartum, which calls for universal health care support to all mothers for ensuring breastfeeding within an hour of birth to provide benefits for both the mothers and children, as postpartum hemorrhage is a major problem that jeopardizes maternal health and its prevention can save mother's lives through early breastfeeding.

- **Breastfeeding reduces the risk of breast and ovarian cancer in mothers**

A reanalysis of data from 47 epidemiological studies in 30 countries found that the relative risk of breast cancer decreased by 4.3% for every year of breastfeeding (Möller *et al.* 2002).

- **Breastfeeding delaying new pregnancies**

During the first six months after birth if a woman is amenorrheoic and fully breastfeeding her infant, she has about 98% protections against another pregnancy. The longer the duration of breastfeeding, longer the duration of postpartum amenorrhoea, leading to longer birth intervals (Saadeh and Benbouzid 1990).

Breastfeeding contributes to natural birth spacing, providing 30% more protection against pregnancy than all the organized family planning programmes in the developing world (Kleinman and Senanayake 1987).

Below is a list of differences in health outcome associated with method of infant feeding. The studies have all adjusted for social and economic variables. All were conducted in an industrialized setting.

Artificially-fed babies are at greater risk of: • Gastro-intestinal infection • Respiratory infections • Necrotising enterocolitis and late onset sepsis in preterm babies • Urinary tract infections • Ear infections • Allergic disease (eczema, asthma and wheezing) • Type 1 and type 2 diabetes • Obesity • Childhood leukemia • Sudden infant death - SIDS	***and breastfed babies may have better:*** • Neurological development • Cholesterol levels • Blood pressure
Other studies of health and breastfeeding for the infant: • Cardiovascular disease in later life • Childhood cancers • Breastfeeding and HIV transmission • Breastfeeding and dental health	***Women who breastfed are at lower risk of:*** • Breast cancer • Ovarian cancer • Hip fractures and reduced bone density
Other potential protective effects of breastfeeding (more research needed): ***for the infant:*** • Multiple sclerosis • Acute appendicitis • Tonsillectomy • Improved parenting • Reduced child neglect/abuse	***for the mother:*** • Rheumatoid arthritis • Maternal type 2 diabetes • Postnatal depression

***Source**:http://www.unicef.org.uk/BabyFriendly/News-and-Research/Research/Breastfeeding-research---An-overview/ as on 9 May 2012.*

In low-income communities, the cost of cow's milk or powdered milk, plus bottles, teats, and fuel for boiling water, can consume 25% to 50% of a family's income (UNICEF/WHO/UNESCO/UNFPAA 1993). It is now accepted that breastfeeding is the best feeding for human babies therefore, dated 19 September, 1983 the Ministry of Social Welfare, GOI has adapted the "Indian National code for Protection and Promotion of Breastfeeding" (Ministry of Social Welfare 1984) .

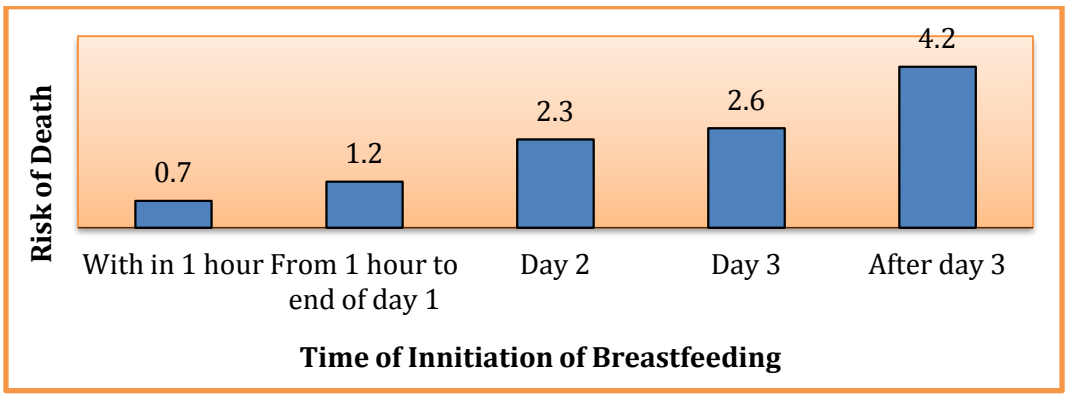
a) ***Timely Initiation of Breastfeeding***

The BFHI Global Criteria (2006) stated "Place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour and encourage mothers to recognize when their babies are ready to breastfeed, offering help if needed" (UNICEF/WHO 2006).

Timely initiation of breastfeeding (TIBF) within one hour of birth is essential as it ensures that baby is immunized with 'live fluid' to sustain life. It has been observed that the suckling reflex of the newborn is at its height twenty to thirty minutes after birth (Pandit *et al.* 1994). If the infant is not fed then the reflex diminishes rapidly only to reappear adequately forty hours later (Arachavsky 1952). This may be called **"The fourth stage of labour"** which includes putting the baby to breast after birth and ensuring the intake of colostrum by the neonate. The exact time of initiation of breastfeeding has been suggested right from birth in the delivery room itself to within one hour after delivery. Also the antibody content of colostrum is at its maximum during the first twelve postpartum hours making it relevant (www.bpni.org 2007).

A recent study of more than 10,000 newborn babies from rural Ghana has shown that if all babies started breastfeeding within one hour, it would cut 22% of all neonatal deaths (Figure 9). This figure would rise to 41% if newborn babies of 2-28 days were counted. This effect was independent of the effect of EBF. The study estimates that, of the four million babies who die in the developing world each year in the first month of life, almost one million newborn children could be saved. The study has also shown that each day's delay in the start of breastfeeding led to a significant increase in deaths, such was the effect of pre-lacteal feeds i.e. giving other foods and fluids before beginning to breastfeed (Edmond *et al.* 2006).

Figure 9 : Risk of neonatal mortality according to time of initiation of breastfeeding



Source: Edmond *et al.* 2006

Early skin-to-skin contact and the opportunity to suckle within the first hour or so after birth are both important. Some contact cannot be avoided when attempting breastfeeding but contact itself does not necessarily result in immediate suckling. Mothers need to be supported for achieving both contact and suckling which are so closely interrelated. It has an important bearing on survival and development of babies. The infant who is in close contact with its mother can suckle when it shows

signs of readiness, such as suckling movements, which are often present during the first hour of birth (Gupta 2007).

The effect of skin-to-skin and suckling contact immediately after birth increases the median duration of breastfeeding by 2 ½ months (de Château *et al.* 1977).The analysis of the following study has shown that those newborns who initiated breastfeeding within 1 hour were less likely to die of *neonatal sepsis* than those who didn't. Each day's delay in the start of breastfeeding led to a significant increase in the risk of *infection deaths* increased with increasing delay in initiation of breastfeeding; overall late initiation (after day 1) was associated with a 2.6 fold risk. Additionally, partial breastfeeding during first month was associated with a 5.7 fold adjusted risk of death as a result of infectious disease after adjusting with the effect of early breastfeeding. The authors concluded that breastfeeding promotion programs that focus on EIBF and EBF in the neonatal period could significantly reduce the burden of infectious disease-related mortality (Edmond *et al.* 2007).

In a sample of Norwegian infants, 69% of those who were suckled at birth were still being nursed at the age of 3 month, compared to only 47% of those who were first suckled after six hours (Arentoft and Jensen 1983). Salariya *et al.* in 1978 also found that babies who were first fed within 30 minutes of birth were likely to remain breastfeeding for longer.

Furthermore, the routine administration of prelacteal feeds interferes with both the mother's confidence and hence the let-down reflex, and suckling stimulation and prolactin production, and it reduces protection from infection (Gillie 1976, Isenalumhe and Oviawe 1987, Jellliffe and Jelliffe 1983).

Thus the above evidence clearly justifies greater action on the first ONE hour. Considering the evidence as vital, beginning breastfeeding within one hour must be considered as a vital first step towards ensuring EBF and should become a part of routine sub national, national and international reporting.

According to IBFAN, the following factors affect women's decision to begin breastfeeding within one hour:

The misconception (which many doctors also believe) that the mother may not be able to produce adequate amounts of milk, lack of support from the health care system, societal norms, values and beliefs, parental or partners' attitude, women's and communities' knowledge, misconceptions about colostrum, inadequate skills/knowledge of frontline workers, 'fixed' hospital routines like beginning with formula feeding at birth, or sugar/glucose water, which directly contributes to failure to begin breastfeeding within one hour (www.ibfanasia.org 2007).

The World Breastfeeding Week (WBW) 2007 aimed precisely towards TIBF, and also to raise public awareness of the benefits of this simple achievable practice on newborn and maternal health (IBFAN 2007). Thus, the IBFAN (2007) recommended building capacity of health workers to improve TIBF rates. To improve TIBF rates and thus survival of newborn babies, a high quality trained workforce is required. Most breastfeeding difficulties can be overcome if all the medical professionals and family level workers have the 'duty' and 'capacity' to assist all mothers at birth, in initiating breastfeeding early and follow upto support EBF. This is true for all births either at home or at the health facilities, both in public and private sector.

b) *Exclusive Breastfeeding for the First Six Months*

Breastfeeding provides the best possible start to life, a foundation for fulfilling rights of the children. The National Guideline on IYCF (2006) defines Exclusive Breastfeeding (EBF) as - the infant takes only breast milk and no additional food, water, or other fluids with the exception of medicines and vitamin or mineral drops (GOI 2006). The breast milk provides adequate water for hydration and this has been discussed under benefits of breastfeeding earlier in the review.

Infants are as much as 25 times more likely to die from diarrhoea in the first six months of life, if not exclusively breast fed (Feachem and Koblensky 1983). Infants EBF for >=4 months have half the mean number of acute otitis media episodes of those not breastfed at all *(*Duncan *et al.* 1993*).*EBF infants have at least 2½ times fewer illness episodes than infants fed breast-milk substitutes (Chandra 1979). In the study by Kull *et al.* (2002) mentioned earlier, children exclusively breastfed for four months or more exhibited less asthma (7.7% vs. 12%), less atopic dermatitis (24% vs. 27%) and less allergic rhinitis (6.5% vs. 9%).

WHO recommends, mothers' worldwide to EBF infants for the first six months to achieve optimal growth, development and health. Thereafter, they should be given nutritious complementary foods and continue breastfeeding upto two years of age or beyond.

The latest systematic review of the evidence on the above issue was published in 2009. The findings of the review, which included two controlled trials and 18 other studies conducted in both developed and developing countries, support current WHO recommendations (Kramer and Kakuma 2009).

The systematic review's findings suggest that EBF of infants with only breast milk, and no other foods or liquids, for six months has several advantages over EBF for 3-4 months followed by mixed breastfeeding. These advantages include a lower risk of

gastrointestinal infection for the baby, more rapid maternal weight loss after birth, and delayed return of menstrual periods. No reduced risks of other infections or of allergic diseases have been demonstrated. No adverse effects on growth have been documented with EBF for six months. But a reduced level of iron has been observed in some developing country settings (Kramer and Kakuma 2009).

c) *Ten Steps to Successful Breastfeeding*

The Baby-Friendly Hospital Initiative (BFHI) is a global effort by UNICEF and the WHO to implement practices that protect, promote and support breastfeeding. It aims to ensure that all maternities whether free standing or in a hospital, become centers of breastfeeding support. Hospitals and maternity units set a powerful example for new mothers.

The "Ten Steps to Successful Breastfeeding" are the foundation of BFHI and summarize the maternity practices necessary to support breastfeeding. A maternity facility can be designated 'baby-friendly' when it does not accept free or low-cost breast milk substitutes, feeding bottles or teats, and has implemented these 10 specific steps to support successful breastfeeding.

The Ten Steps to Successful Breastfeeding states that every facility providing maternity services and care for newborn infants should:

(i). Have a written breastfeeding policy that is routinely communicated to all health care staff

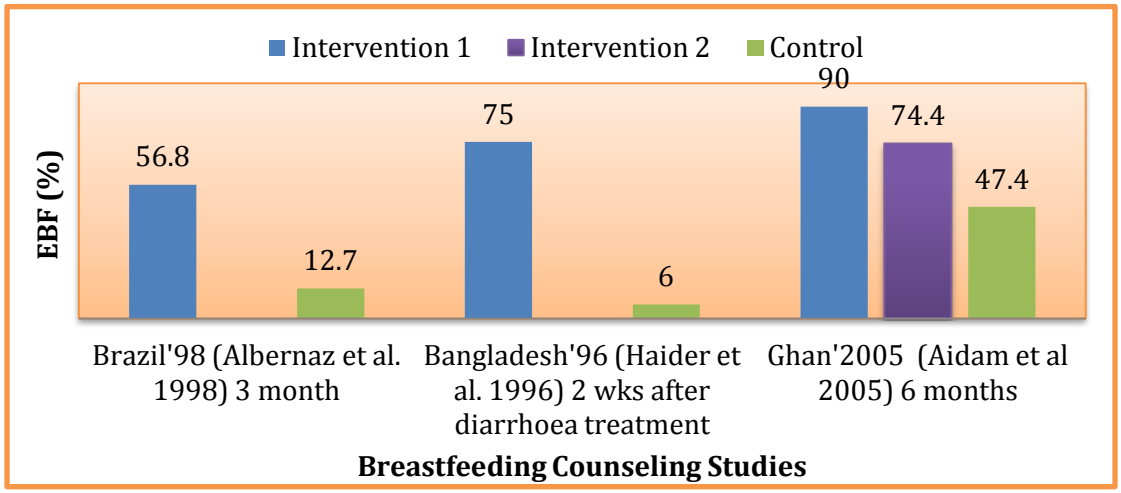
(ii). Train all health care staff in skills necessary to implement this policy

In several studies health professionals trained in breastfeeding counseling provided counseling and/or trained support groups to assist mothers in a variety of circumstances (prenatal, postnatal, after admission for diarrhoea). In each of the studies (Figure 10) there was a significant increase in EBF, when compared to the control group. All differences between intervention and control groups were significant at $p<0.001$ (WHO/CAH. 2000).

(iii). Inform all pregnant women about the benefits of breastfeeding

Studies have shown that, antenatal care can significantly impact breastfeeding practices related to colostrum feeding and early breastfeeding initiation (Nielsen *et al.* 1998)**.** Guise *et al.* 2003 showed in a meta-analysis of studies of education and support that antenatal education can lead to significant increases in initiation rates by 23% and duration of short-term breastfeeding (upto 3 mo.) by 39%.

Figure 10 : Breastfeeding Counseling Increases Exclusive Breastfeeding



(iv). Help mothers initiate breastfeeding within a half-hour of birth

Babies have a fundamental right to adequate nutrition and care, which includes the correct nutrition immediately after birth. Only breastfeeding within the first hour of birth ensures this right. To initiate breastfeeding within one hour, women need accurate information and assistance at the time of birth, especially to ensure that the baby is in the right suckling position. Health care providers have the responsibility to provide practical help and support both at home and in hospitals (both public/private). Women should have an entitlement to such a support, as without it they cannot help the baby realize its right to adequate nutrition and care.

(v). Showing mothers how to breastfeed and how to maintain lactation, even if they should be separated from their infants

Contrary to popular belief, attaching the baby on the breast is not an ability with which a mother is born; rather it is a learned skill which she must acquire by observation and experience (Woolridge 1986). The duration of breastfeeding almost double in a mother discharged from hospital with good technique or after 5-10 min of instruction/correction of faulty technique, compared to one discharged with uncorrected faulty breastfeeding technique (Righard and Alade 1992). Timely breastfeeding initiation occurred among 75% of women who were encouraged to breastfeed compared to only 43% who were not encouraged to breastfeed by a health professional (Lu *et al.* 2001).

(vi). Giving newborn infants no food or drink other than breast milk unless medically indicated

Water in breast milk exceeds the infant's water requirements in normal conditions and is adequate for breastfed infants in hot, dry climates. Studies indicate that

healthy, exclusively breastfed infants in the first six months of life do not require additional fluids even in countries with extremely high temperatures and low humidity. Solute levels in the urine and blood of exclusively breastfed babies living in these conditions were within normal ranges, indicating adequate water intakes (WHO 1997a).

(vii). Practicing rooming-in — allow mothers and infants to remain together - 24 hours a day

Practicing rooming in reduces costs, requires minimal equipment, requires no additional personnel, reduces infection, helps establish and maintain breastfeeding and facilitates the bonding process.

(viii). Encouraging breastfeeding on demand

Breastfeeding should be encouraged whenever the baby or mother wants with no restrictions on the length or frequency of feeds. Yamauchi and Yamanouchi in 1990 demonstrated the positive impact of on-demand, frequent breastfeeding (number of times during the first 24 hours) on bilirubin levels of 6 day old full-term healthy infants. de Carvalho *et al.* in 1982 showed that the greater the frequency of feeds, the lower the level of serum bilirubin.

(ix). Giving no artificial teats or pacifiers (also called dummies and soothers) to breastfeeding infants

Both pacifiers and artificial teats can be harmful, by carrying infection, by reducing the time spent suckling at the breast and thereby interfering with demand feeding, and possibly by altering oral dynamics (WHO 1998b).

Victora *et al.* (1997) showed that intense pacifier users at 1 month (children who used the pacifiers during most of the day and at least until falling asleep) were four times more likely to stop breastfeeding at 6 months of age than non-users.

(x). Fostering the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic

WHO, in “Breast-feeding: the Technical Basis and Recommendations for Action” mentioned that “The Key to Best Breastfeeding Practices is Continued Day-to-Day Support for The Breastfeeding Mother within Her Home and Community” (WHO 1993).

The WHO Community-Based Strategies for Breastfeeding Promotion and Support in Developing Countries (WHO 2003) cites several reviews of the evidence for mother support. Sikorski *et al.* identified 20 trials of breastfeeding support in 10 countries

which revealed a significant beneficial effect of breastfeeding support on any breastfeeding, with the greatest effect on EBF (Sikorski *et al.* 2002). Lay counsellors were found to be most effective in increasing the duration of EBF, and professional counsellors were most effective in extending the duration of any breastfeeding.

d) *Elements for Supporting a mother to breastfeed*

In 2008, the World Alliance for Breastfeeding Action (WABA) calls for increased support for mothers striving to achieve the gold standard of infant feeding: to breastfeed their babies exclusively for the first six months, and continue breastfeeding together with feeding other appropriate complementary foods, upto two years and beyond.

WBW 2008 uses 5 colored CIRCLES to represent the types of support a breastfeeding woman call upon for help and encouragement. Circles of Support overlap, interact, and strengthen each other, with centre circle as the focus.

Women not only receive support from many sources; they actively secure support and provide it as well. Women are key players in all CIRCLES. Strong support in the outer circles creates a growing power in the centre that radiates out to the other circles of support. The strong network of mother-to-mother support organizations around the world, founded and maintained by women, are a vital demonstration of this concept.

When all the Circles are strong and providing seamless mother support for breastfeeding, the result is truly empowering for future generations. The goal is that in whatever direction in the centre circle she turns, a mother receives positive and empathetic support for her breastfeeding experience.

"Breastfeeding a baby is a community concern; a celebrative occasion – everyone has a role to make it successful. A breastfeeding friendly environment needs supportive people in every corner." – Negeya Sadig, Sudan from WBF 2008 Folder

e) *Breastfeeding Scenario*

- **India**

While breastfeeding is nearly universal in India, very few children are put to the breast immediately after birth. Only one-quarter of last-born children who were ever breastfed started breastfeeding within half an hour of birth, as is recommended, and almost half (45%) did not start breastfeeding within one day of birth. Most mothers (57%) gave their last-born child something to drink other than breast milk in the three

days after delivery. Only 69% of children under two months of age are Exclusively Breastfed. EBF drops to 51% at 2-3 months and 28% at 4-5 months of age. Overall, slightly less than half of children under six months of age are exclusively breastfed (NFHS-3 2007).

- **Gujarat**

Although breastfeeding is nearly universal in Gujarat, as per the District Level Household and Facility Survey (DLHS) – 3 2007-08 for Gujarat about half of women (48%) had initiated breastfeeding within one hour of child birth, which showed improvement as compared to the NFHS-3 results. More than three-fourth of the children (77.8%) were breastfed within 24 hours of birth. Further, the DLHS-3 results showed that 76% of children below 3 years were fed with colostrum and there was a small variation by residence (NFHS-3 2007 and DLHS-3 2010).

The proportion of youngest surviving child who had exclusively breastfed for 6 months was 41.6%, which was less compared to 48% reported by NFHS-3 (DLHS-3 2010 and NFHS-3 2007). Median duration of EBF of the youngest surviving child was 4.02 months (DLHS–3 2010).

Lastly, NFHS-3 reported that mothers in Gujarat breastfeed for an average of 23 months, which is only one month less than the minimum 24 months recommended by WHO for most children.

3. Complementary Feeding

When breast milk is no longer enough to meet the nutritional needs of the infant, complementary foods should be added to the diet of the child. The transition from EBF to family foods, referred to as complementary feeding (CF), typically covers the period from 6 to 18-24 months of age, and is a very vulnerable period.

It is estimated that over half of malnutrition occurs in families with adequate food (Rae 2006). Most incidents stunting and wasting (outside of famine situations) happens in first 2 years when children have high demand for nutrients and there are limitations in the quality and quantity of their diets, especially after the period of EBF (Shrimpton *et al.* 2001). Suboptimum CF is clearly a determinant of stunting, and improvements in most settings need to focus on both feeding frequency and energy density, and ensure an adequate quality diet, including sufficient micronutrients (Brown *et al.* 1998).

CF should be ***timely***, meaning that all infants should start receiving foods in addition to breast milk from 6 months onwards. It should be ***adequate***, meaning that the complementary foods should be given in amounts, frequency, consistency and using a variety of foods to cover the nutritional needs of the growing child while maintaining

breastfeeding. Foods should be prepared and given in a safe manner, meaning that measures are taken to minimize the risk of contamination with pathogens. And they should be given in a way that is ***appropriate***, meaning that foods are of appropriate texture for the age of the child and applying responsive feeding following the principles of psycho-social care.

The adequacy of CF (adequacy in short for timely, adequate, safe and appropriate) not only depends on the availability of a variety of foods in the household, but also on the feeding practices of caregivers. Feeding young infants requires active care and stimulation, where the caregiver is responsive to the child clues for hunger and also encourages the child to eat. This is also referred to as active or responsive feeding.

WHO recommends that infants start receiving complementary foods at 6 months of age in addition to breast milk, initially 2-3 times a day between 6-8 months, increasing to 3-4 times daily between 9-11 months and 12-24 months with additional nutritious snacks offered 1-2 times per day, as desired. Research has shown that caregivers require skilled support to adequately feed their infants.

a) *Guiding principles for complementary feeding of the breastfed child*

The Guiding Principles for Complementary feeding of the Breastfed Child (2003) developed by the Pan American Health Organization (PAO), summarize the current scientific evidence for CF and are intended to guide policy and programmatic action at global, national and community levels (WHO/PAHO 2003), while the Guiding Principles for feeding the non-breastfed child 6-24 months of age (2005) provide guidance for feeding children who are not receiving breast-milk (WHO 2005).

These guidelines can be used as the basis for developing recommendations on CF for breastfed children 6-23 months of age. The guiding principles not only set standards for practical dietary guidelines, they also discuss when, where and how young children should be fed. The guidelines are a result of several consultations and documents on CF, and represent state-of-the art knowledge on CF. Following are the Guiding Principles for Complementary Feeding of the Breastfeed Child:

- ***Duration of Exclusive Breastfeeding and Age of Introduction of Complementary Foods***.

***Guideline*:** Practice exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed.

***Scientific Rationale*:** In May, 2001 the 54th World Health Assembly urged Member States to promote EBF for six months as a global public health recommendation

(World Health Assembly Resolution 2001). This recommendation followed a report by a WHO Expert Consultation on the Optimal Duration of EBF (WHO 2001a), which considered the results of a systematic review of the evidence (Kramer and Kakuma 2002) and concluded that EBF for six months confers several benefits on the infant and the mother. The Expert Consultation concluded that the potential health benefits of waiting until six months to introduce other foods outweigh any potential risks.

After six months of age, however, it becomes increasingly difficult for breastfed infants to meet their nutrient needs from human milk alone (WHO/UNICEF 1998). Furthermore, most infants are developmentally ready for other foods at about six months (Naylor and Morrow 2001).

In environments where environmental sanitation is very poor, waiting until even later than 6 months to introduce complementary foods might reduce exposure to food-borne pathogens. However, because infants are beginning to actively explore their environment at this age, they will be exposed to microbial contaminants through soil, etc. even if they are not given complementary foods. Thus, the consensus was that six months is the appropriate age to introduce complementary foods

- ***Maintenance of Breastfeeding***

***Guideline*:** Continue frequent, on-demand breastfeeding until 2 years of age or beyond.

***Scientific Rationale*:** Breastfeeding continues to make an important nutritional contribution well beyond the first year of life. Breastfed children at 12-23 months of age whose intake is similar to the "average" amount of breast milk consumed at that age (about 550 g/d in developing countries; WHO/UNICEF 1998) receive 35-40% of total energy needs from breast milk (Dewey and Brown 2003). Because breast milk has a relatively high fat content compared to most complementary foods, breast milk is a key source of energy and essential fatty acids.

In a study conducted in Gambia, it was estimated that breast milk provides 70% of vitamin A, 40% of calcium and 37% of riboflavin intake at 15-18 months of age (Prentice and Paul 1990). The nutritional impact of breastfeeding is most evident during periods of illness, when the child's appetite for other foods decreases but breast milk intake is maintained (Brown *et al.* 1990). Breast milk thus plays a key role in preventing dehydration and providing the nutrients required for recovery from infections.

Although the impact of breastfeeding past the first year of life on infant appetite and growth has been controversial (Caulfield *et al.* 1996, Habicht 2000), recent longitudinal studies demonstrate that in developing countries, a longer duration of

breastfeeding is associated with greater linear growth, when the data are analyzed appropriately to eliminate the influence of confounding variables and reverse causation (Onyango *et al.* 1999, Simondon *et al.*, 2001).

- ***Responsive Feeding***.

***Guideline*:** Practice responsive feeding, applying the principles of psychosocial care (Engle *et al.* 2000, Pelto *et al.* 2003). Specifically: a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; b) feed slowly and patiently, and encourage children to eat, but do not force them; c) if children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement; e) minimize distractions during meals if the child loses interest easily; f) remember that feeding times are periods of learning and love-talk to children during feeding, with eye to eye contact.

***Scientific Rationale*:** There is increasing recognition that optimal CF depends not only on what is fed, but also on how, when, where, and by whom the child is fed (Pelto *et al.* 2003). Several intervention studies that included feeding behaviors as part of the recommended practices have reported positive effects on child growth (Sternin *et al.* 1997, Creed de Kanashiro *et al.* 2001), but it is not possible to separate the influence of responsive feeding from that of the other changes that occurred in breastfeeding practices and the types of complementary foods offered

- ***Safe Preparation and Storage of Complementary Foods***.

Guideline: Practice good hygiene and proper food handling by a) washing caregivers' and children's hands before food preparation and eating, b) storing foods safely and serving foods immediately after preparation, c) using clean utensils to prepare and serve food, d) using clean cups and bowls when feeding children, and e) avoiding the use of feeding bottles, which are difficult to keep clean.

***Scientific Rationale*:** Attention to hygienic practices during food preparation and feeding is critical for prevention of gastrointestinal illness. The peak incidence of diarrheal disease is during the second half year of infancy, as the intake of complementary foods increases (Martinez *et al.* 1992).

Although there are significant barriers to compliance with the above recommendations in many settings (including lack of safe water and facilities for safe preparation and storage of food, and time constraints for the caregivers), carefully planned educational interventions can result in substantial improvement (Monte *et al.* 1997). In addition, use of fermented foods can reduce the risk of microbial contamination (Kimmons *et al.* 1999) and has the added advantage of improving nutrient content (WHO 1998a).

- ***Amount of Complementary Food Needed***.

Guideline: Start at 6 months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding. The energy needs from complementary foods for infants with "average" breast milk intake in developing countries (WHO/UNICEF 1998) are approximately 200 kcal per day at 6-8 months of age, 300 kcal per day at 9-11 months of age, and 550 kcal per day at 12-23 months of age. In industrialized countries these estimates differ somewhat (130, 310 and 580 kcal/d at 6-8, 9-11 and 12-23 months, respectively) because of differences in average breast milk intake.

***Scientific Rationale*:** The above guideline is based on children receiving average amounts of breast milk at each age. If an infant is consuming more or less breast milk than the average, the amount needed from complementary foods will differ accordingly. In practice, caregivers will not know the precise amount of breast milk consumed, nor will they be measuring the energy content of complementary foods to be offered. Thus, the amount of food to be offered should be based on the principles of responsive feeding, while assuring that energy density and meal frequency are adequate to meet the child's needs (i.e. principle 7).

It is important not to be overly prescriptive about the amount of complementary foods to be consumed, recognizing that each child's needs would vary due to differences in breast milk intake and variability in growth rate. Furthermore, children recovering from illness or living in environments where energy expenditure is high may require more energy (WHO/PAHO 2003).

- ***Food Consistency***.

Guideline: Gradually increase food consistency and variety as the infant gets older adapting to the infant's requirements and abilities. Infants can eat pureed, mashed and semi-solid foods beginning at six months. By 8 months most infants can also eat "finger foods" (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods, as explained in principle 8 below). Avoid foods that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as nuts, grapes, raw carrots).

***Scientific Rationale*:** The neuromuscular development of infants dictates the minimum age at which they can ingest particular types of foods (WHO/UNICEF 1998). Semi-solid or pureed foods are needed at first, until the ability for "munching" (up and down mandibular movements) or chewing (use of teeth) appears. The ages

listed above represent the usual capabilities of normal, healthy infants. When foods of inappropriate consistency are offered, the child may be unable to consume more than a trivial amount, or may take so long to eat that food intake is compromised. Evidence from several sources (Dewey and Brown 2003) indicates that by 12 months, most infants are able to consume "family foods" of a solid consistency, although many are still offered semi-solid foods (presumably because they can ingest them more efficiently, and thus less time for feeding is required of the caregiver). There is suggestive evidence of a "critical window" for introducing "lumpy" solid foods: if these are delayed beyond 10 months of age, it may increase the risk of feeding difficulties later on (Northstone *et al.* 2001). Thus, although it may save time to continue feeding semi-solid foods, for optimal child development it is advisable to gradually increase food consistency with age.

- ***Meal Frequency and Energy Density***.

Guideline: Increase the number of times that the child is fed complementary foods as he/she gets older. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. For the average healthy breastfed infant, meals of complementary foods should be provided 2-3 times per day at 6-8 months of age and 3-4 times per day at 9-11 months and 12-24 months of age, with additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) offered 1-2 times per day, as desired. Snacks are defined as foods eaten between meals-usually self-fed, convenient and easy to prepare. If energy density or amount of food per meal is low, or the child is no longer breastfed, more frequent meals may be required.

***Scientific Rationale*:** The above guideline is based on theoretical estimates of the number of feedings required, calculated from the energy needs from complementary foods, and assuming a gastric capacity of 30 g/kg body weight/d and a minimum energy density of complementary foods of 0.8 kcal/g (Dewey and Brown 2003). When energy density of the usual complementary foods is lesser than 0.8 kcal/g, or infants typically consume amounts that are less than the assumed gastric capacity at each meal, meal frequency would need to be higher than the values shown above. A meal frequency that is greater than necessary may lead to excessive displacement of breast milk. In Guatemala, a social marketing campaign to promote feeding complementary foods five times per day had the unintended consequence of reducing breastfeeding frequency in children 19-24 months of age (from an average of 6.9 day time feedings prior to the intervention, to 3.7 daytime feedings after the intervention, p=0.01; Rivera *et al.* 1998). In addition, preparing and feeding five

meals per day requires a considerable amount of time and effort by caregivers, which may prompt them to hold prepared food over from one meal to the next, thereby potentially increasing the risk of microbial contamination. These considerations should be borne in mind when developing messages regarding meal frequency. The use of 1 to 2 nutritious snacks per day, such as a piece of fruit or a piece of bread or chapatti with nut paste, will not require time for preparation and may also be less likely to displace breast milk.

- ***Nutrient Content of Complementary Foods***.

Guideline: Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used (principle 9 scientific rational). Vitamin A-rich fruits and vegetables should be eaten daily. Provide diets with adequate fat content. Avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.

Scientific Rationale*: *Micronutrient content - Because of the rapid rate of growth and development during the first two years of life, nutrient needs per unit body weight of infants and young children are very high. Recommended Nutrient Intake that needs to be supplied by complementary foods is 97% for iron, 86% for zinc, 81% for phosphorus, 76% for magnesium, 73% for sodium and 72% for calcium (Dewey 2001). Given a relatively small amount of complementary food that are consumed at 6-24 months the nutrient density (amount of each nutrient per 100 kcal of food) of complementary foods needs to be very high.

In environments with poor sanitation, promotion of liquid milk products is risky because they are easily contaminated, especially when fed by bottle. Fresh, unheated cow's milk consumed prior to 12 months of age is also associated with fecal blood loss and lower iron status (Ziegler *et al.* 1990, Griffin and Abrams 2001). For these reasons it may be more appropriate during the first year of life to choose dairy products such as cheese, yogurt and dried milk (mixed with other foods, e.g. in a cooked porridge).

Fat content - Fat is important in the diets of infants and young children because it provides essential fatty acids, facilitates absorption of fat soluble vitamins, and enhances dietary energy density and sensory qualities. Breast milk is generally a more abundant source of fat than most complementary foods. Thus, total fat intake usually decreases with age as the contribution of breast milk to total dietary energy declines. Although there is debate about the optimal amount of fat in the diets of

infants and young children, the range of 30-45% of total energy has been suggested (Dewey and Brown 2003, Bier *et al.* 1999) as a reasonable compromise between the risks of too little intake (such as inadequate essential fatty acids and low energy density) and excessive intake (thought to potentially increase the likelihood of childhood obesity and future cardiovascular disease, although the evidence on this point is limited, Milner and Allison 1999).

Beverages with low nutrient value - Tea and coffee contain compounds that can interfere with iron absorption (Allen and Ahluwalia 1997), and thus are not recommended for young children. Sugary drinks, such as soda, should be avoided because they contribute little other than energy, and thereby decrease the child's appetite for more nutritious foods. Excessive juice consumption can also decrease the child's appetite for other foods, and may cause loose stools. For this reason, the American Academy of Pediatrics (1998) recommends no more than 240 ml of fruit juice per day. Studies in the U.S. have linked excess fruit juice consumption to failure to thrive (Smith and Lifshitz 1994) and to short stature and obesity (Dennison *et al.* 1997), although such outcomes have not been consistently observed (Skinner *et al.* 1999).

- ***Use of Vitamin-Mineral Supplements or Fortified Products for Infant and Mother***.

Guideline: Use fortified complementary foods or vitamin-mineral supplements for the infant, as needed. In some populations, breastfeeding mothers may also need vitamin mineral supplements or fortified products, both for their own health and to ensure normal concentrations of certain nutrients (particularly vitamins) in their breast milk.

***Scientific Rationale*:** Unfortified complementary foods that are predominantly plant-based generally provide insufficient amounts of certain key nutrients (particularly iron, zinc and calcium) to meet the recommended nutrient intakes during the age range of 6-24 months (WHO/UNICEF 1998, Gibson *et al.* 1998, Dewey and Brown 2003). Inclusion of animal-source foods can meet the gap in some cases, but this increases the cost and thus may not be practical for the lowest income groups. Furthermore, the amounts of animal-source foods that can feasibly be consumed by infants (e.g., at 6-12 mo.) are generally insufficient to meet the gaps in iron, calcium and sometimes zinc (WHO/UNICEF 1998). Gibson *et al.* (1998) evaluated 23 different complementary food mixtures used in developing countries, some of which included animal-source foods. None of them achieved the desired iron density and few achieved the desired calcium or zinc density.

- ***Feeding During and After Illness***.

Guideline: Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, varied, appetizing, favorite foods. After illness, give food more often than usual and encourage the child to eat more.

***Scientific Rationale*:** During illness, the need for fluids is often higher than normal. Sick children appear to prefer breast milk to other foods (Brown *et al.* 1990), so continued, frequent breastfeeding during illness is advisable. Even though appetite may be reduced, continued consumption of complementary foods is recommended to maintain nutrient intake and enhance recovery (Brown 2001). After illness, the child needs greater nutrient intake to make up for nutrient losses during the illness and allow for catch-up growth. Extra food is needed until the child has regained any weight lost and is growing well again.

b) ***Guiding principles Feeding non-breastfed children 6–23 months of age***

Sometimes young children between the ages of 6 months and 2 years are not breastfed. Reasons include when their mother is unavailable, or has died, or is HIV-positive. These children need extra food to compensate for not receiving breast milk, which can provide one half of their energy and nutrient needs from 6 to 12 months, and one-third of their needs from 12‑23 months (WHO 2005).

To feed children aged 6‑23 months satisfactorily, all the principles of safe, adequate CF apply, as described for the breastfed children. However, to cover the requirements that would otherwise be covered by breast milk, a child needs to be fed a larger quantity of the foods containing high-quality nutrients. This can be achieved by giving the child:

- **Extra meals**, to help ensure that sufficient amounts of energy and nutrients are eaten - non-breastfed children need to eat meals 4‑5 times per day with additional nutritional snacks 1‑2 times per day as desired.
- **Meals of greater energy density**, to help ensure that sufficient energy is consumed - Foods of thick consistency or with some added fat, help to ensure an adequate intake of energy for a child.
- Larger quantities of **foods of animal origin** to help ensure that enough nutrients are eaten. Some meat, poultry or fish should be eaten every day to ensure that the child gets enough iron and other nutrients. Dairy products are important to provide calcium. A child needs 200‑400 ml of milk or yoghurt every day if other animal source foods are eaten, or 300‑500 ml per day if no other animal source

foods are eaten.

- **Vegetable foods -** The child should be given pulses daily to help provide iron and vitamins, with Vitamin-c rich foods to help iron absorption. The child should also be given orange and yellow fruits and dark-green leafy vegetables to provide vitamin A and other vitamins
- **Nutrient supplements**, if foods of animal origin are not available - If the child receives no foods of animal origin, then it is necessary to give vitamin and mineral supplements to ensure sufficient intake, particularly of iron, zinc, calcium and vitamin B12.

c) *Complementary Feeding Scenario*

WHO offers three recommendations for infant and young child feeding (IYCF) practices for children 6-23 months old: continued breastfeeding or feeding with appropriate calcium-rich foods if not breastfed; feeding solid or semi-solid food for a minimum number of times per day according to age and breastfeeding status; and, including foods from a minimum number of food groups per day according to breastfeeding status.

- **India**

According to NFHS-3 report, in India, CF is started in 19% at 4 to 5 months which increased to 55% at 6 to 8 months of age. The most common types of solid or semi solid foods fed to both breastfeeding and non-breastfeeding children comprised of grains, fruits and vegetables. Milk and Milk products (86%) and foods made with oil or ghee were less commonly given to young children. 35.8% of the male children and 34.8% of female children were receiving appropriate number of food groups. 43.4% were receiving feeding in required frequency. 41.3% and 41.6% male and female children were given feeds minimum number of times respectively. However, only 21% were fed appropriately according to all three recommended IYCF practices (NFHS-3 2007).

A study by Ghosh *et al.* (1976) studied the traditional patterns of weaning food in different parts of India. They stated that when weaning starts, traditional economy and local availability seems to determine the choice of food. In Tamilnadu and Kerala "Tropical, Banana, Ragi and Kanji" is given. In Andhra Pradesh boiled polished rice is given. Dal or rice gruel is also given with Ghee. Biscuits are used in almost all parts of India. In Calcutta, rice Kanji is usually the first non-milk food. In Bombay, rice gruel is often the first food. In Rajasthan, preparation made form Jawar and Bajara flour

are used; “Churi” is prepared in Punjab.

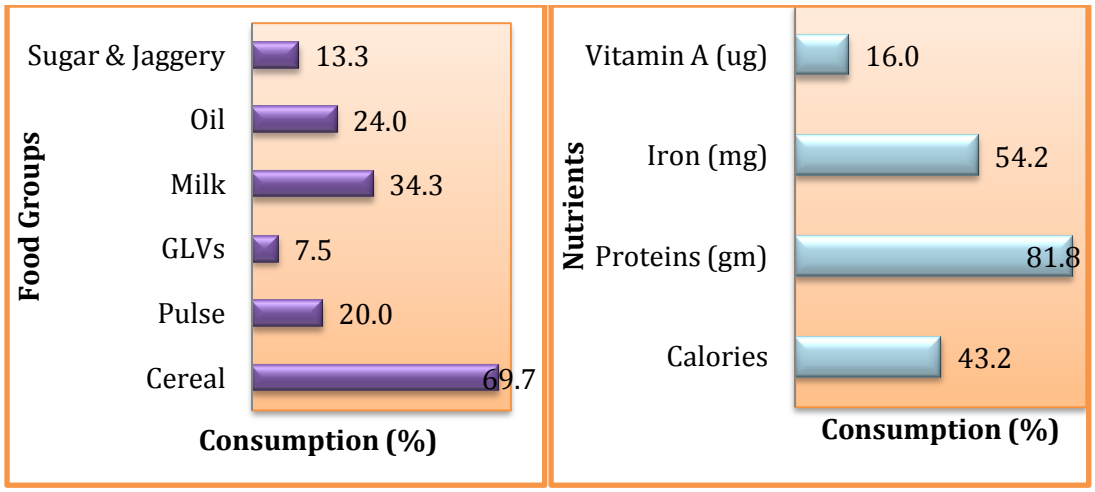
- **Gujarat**

In Gujarat, only 42% children aged 6-23 months were fed the recommended minimum times per day and 34% were fed from the minimum number of food groups. Overall, only one in five (21%) were fed according to all three IYCF recommended practices (NFHS-3 2007).

As per the District Level Household and Facility Survey (DLHS)–3 2007-08 for Gujarat, for those children who had started food supplementation while still breastfeeding, the median age in months at the time of other fluids, semi-solid food and solid food supplementation were 6.2 months, 8.3 months and 11.3 months respectively (DLHS-3 2010).

A study conducted by National Nutrition Monitoring Bureau (NNMB) for nine states including Gujarat showed that, although consumption of protein and calories is highest in Gujarat State, consumption of food inadequate in both protein and calories is 30% in 1-3 years group and 22% in 4-6 years age group children in Gujarat (NNMB 2006). Further there was a wide gap in consumption of food against RDA (ICMR) among 1-3 years. Gap in Gujarat is the widest in Milk consumption in the age group of 1-3 years (Figure 11). Vital calorie consumption is only ~ 45% against RDA (Figure 11).

Figure 11 : Consumption Pattern of 1-3 years in Gujarat (NNMB 04-05)



This is because the cereals form a large proportion of food that meets most of the protein requirements but not the calories. Consumption of micronutrients like iron and Vitamin-A is extremely poor (NNMB 2006). There is a deficit of over 500 calories in the intakes of 1-3 years old and about 700 calorie among the 3-6 years old. There are bound to be additional multiple vitamin and mineral deficiencies when there is a

55% deficit in calories (NNMB 2006).

Pant and Chothia (1990) assessed the knowledge of mothers of the high income group of urban Baroda, related to breastfeeding and weaning. Results indicated that top feeding and solid supplements were initiated at 4-6 months mainly commercial baby foods were used for weaning. Most mothers avoided 'dals' for the child because these were believed to be difficult to digest and produce gas in child's stomach.

4. Infant and young child feeding counseling

Infant and young child feeding counseling is the process by which a health worker can support mothers and babies to implement good feeding practices and help them overcome difficulties (WHO 2009).

a) *Infant and Young Child Feeding Counseling Skills*

Details of infant and young child feeding counseling depend on the child's age and the mother's circumstances. Generally, a health worker should:

Use Good Communication and Support Skills:

If a health care worker is to effectively counsel a mother or other caregiver, he or she should have good communication skills.

There are two groups of skills, also refer Box 1 (WHO 2009).

Box 1: Communication and support skills

Listening and learning

- Use helpful non-verbal communication.
- Ask open questions.
- Use responses and gestures which show interest.
- Reflect back what the mother says.
- Empathize – show that you understand how she feels.
- Avoid words which sound judging.

Building confidence and giving support

- Accept what a mother thinks and feels.
- Recognize and praise what a mother and infant are doing right.
- Give practical help.
- Give a little, relevant information.
- Use simple language.
- Make one or two suggestions (e.g. small "do-able" actions), not commands.

***Source**: WHO 2009*

- **Listening and learning skills** helps to encourage a mother to talk about her

situation and how she feels in her own way, and helps to pay attention to what she is saying.

- **Building confidence and giving support skills** helps to give mother information and suggest what she might do in her situation, so that she can decide for herself what to do. Supporting a mother is more useful than giving direct advice which she may not be able to follow.

Assess the situation

Assess the child's growth

Assessing a child's growth provides important information on the adequacy of the child's nutritional status and health. There are several measures to assess growth, including weight-for-age, weight-for-height, and height-for-age. Currently the new WHO growth standards (Onis 2006), are the standard for measuring nutritional status, and been used by health workers in countries like India. It is recommended to use separate standards for boys and girls.

When counseling on IYCF, it is important to understand growth charts. If growth is not recorded correctly, and charts are not interpreted accurately, incorrect information can be given to a mother, leading to worry or loss of confidence.

- ***Take a feeding history***

During any contact with a mother and child, it is important to ask how feeding is progressing. Simple open questions can generate a great deal of information

- ***Observe Mother How She Breastfeed***

At all contacts with lactating mothers of infants under 2 months of age it is important to observe mother how she breastfeed. After the age of 2 months, observation may be included only if a mother has any feeding difficulty or if the infant has growth faltering or low weight-for-age.

To initiate an observation the health worker may

- Ask mother whether she could offer her baby the breast and to breastfeed in her usual way.
- Try to observe a complete feed, to see how long the baby suckles for, and if he or she releases the breast by him- or herself.

If the mother has obvious difficulties, it may be appropriate to interrupt the feed in order to help her to improve positioning and attachment while the baby is still hungry. The health workers may use standardized breastfeed observation job aid as a tool (Box 2) to assist in observing a breastfeed (WHO 2009).

Box 2 : Feeding History Job Aid, children 6–23 months
Is the child still breastfed? – How many times per day? Day and night? – If using expressed breastmilk how is the milk stored and given?
What other foods is the child receiving? – How many meals and snacks each day? – How much food at each meal? – What is the consistency of the main meals? – Do meals include: animal-source foods, dairy products, dark green vegetables or red or orange fruits or vegetables, pulses (beans, lentils, peas, nuts), oil? – Who helps the child to eat? – What bowl does the child get food from (his or her own bowl, or the family pot)? – Is the child given any vitamin or mineral supplements? – How does the child eat during sickness?

Assess the health of the child and the mother.

Assessing the health of the child

During counseling on feeding it is important to assess the health status of the child using the systematic approach described in the IMCI guidelines (WHO 1997b, WHO 2001b), and manage the child accordingly.

Assessing the health of the mother

During counseling on feeding it is also important to enquire about the mother's own health status, her mental health, her social situation and her employment. These are all factors that will affect her ability to care for her young child.

Manage problems and supporting good practices:

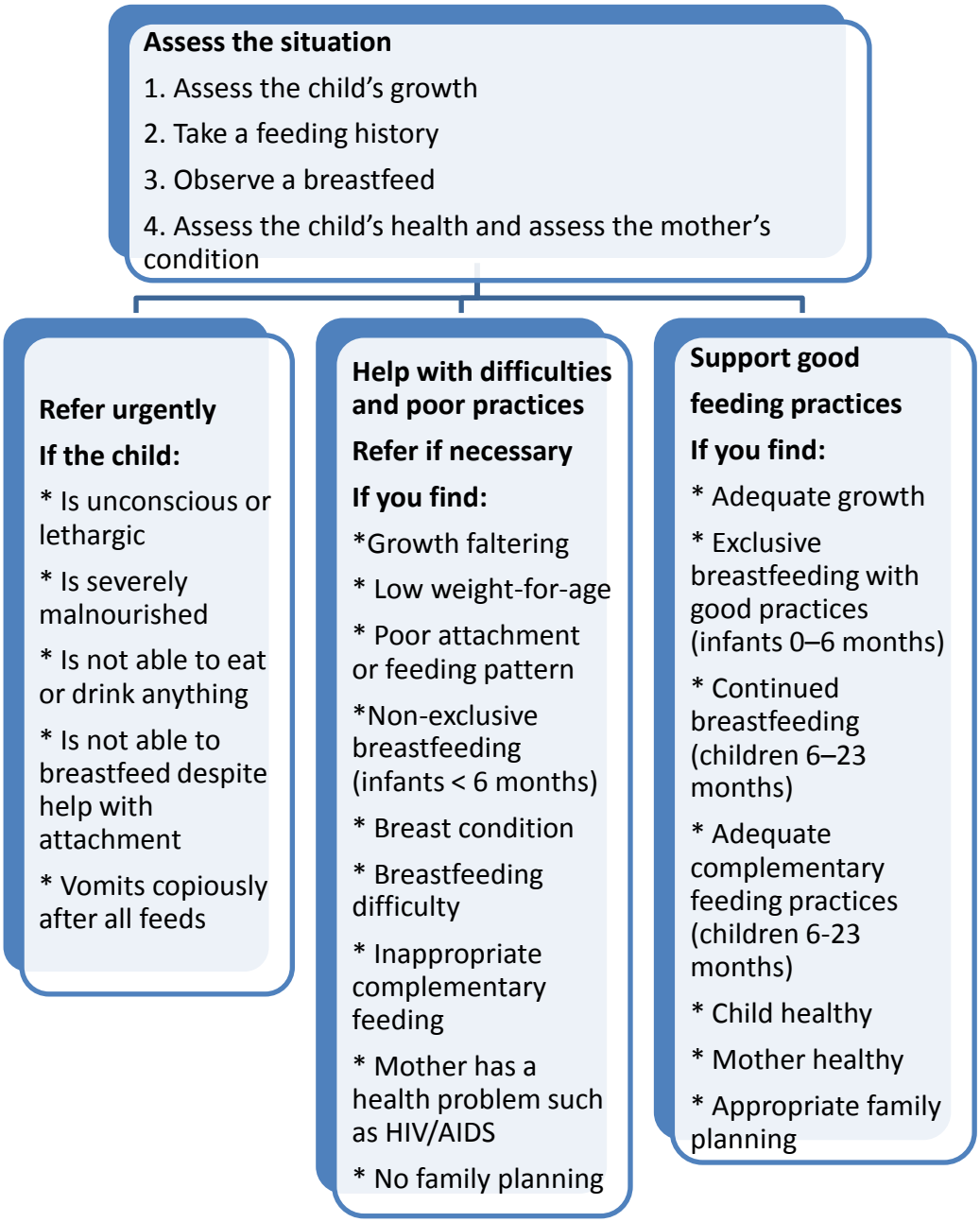
The results of the assessment are used to classify the mother and baby according to their situation and to decide on management. Figure 12, summarizes three categories of actions that may be required, namely:

a) Refer the mother and child if needed
b) Help the mother with feeding difficulties or poor practices
c) Support good feeding practices

Further,

d) Counsel the mother on her own health, nutrition and family planning.

Figure 12 : Assessing and Classifying IYCF



***Source**: WHO 2009*

Counseling on feeding also provides a unique opportunity to counsel mothers about their own nutrition and to ensure that they are fully informed and able to access family planning. If the mother is taking medication, there is only rarely a reason to advise her to stop breastfeeding.

Follow-up

Follow-up and continuing care of all children is important, whether they have feeding difficulties or not, in order to support good practices, prevent difficulties and manage difficulties if they arise. Follow-up may take place at a health facility or on a home

visits.

b) *Impact of Infant and young child feeding Counseling*

The Cochrane Review evaluated 34 trials from 14 countries for effects on the duration of any breastfeeding (both partial and exclusive) and EBF alone. The review found that all forms of support, professional and lay, analyzed together, significantly extended the duration of any breastfeeding, and had an even greater effect on the duration of EBF (Britton *et al.* 2007).

An intervention study in india, Bhanderi *et al.* (2003) in Haryana, assessed the feasibility, effectiveness and safety of an educational intervention to promote EBF for 6 months, and showed that promotion of EBF until age 6 months in a developing country through existing primary health-care services is feasible, reduces the risk of diarrhea, and does not lead to growth faltering.

The effects on linear growth seem to be best with interventions that use specific educational messages e.g., on consumption of animal-source foods, emphasize energy density of the diet, and, in areas with food insecurity or low consumption of sources of micronutrients, provide food supplements with micronutrient fortification (Dewey *et al.* 2008, Penny *et al.* 2005).

Improvement of CF through strategies such as counseling about nutrition for populations which are food secure and nutrition counseling, food supplements, conditional cash transfers or a combination of these, in food-insecure populations could substantially reduce stunting and related burden of disease (Bhutta *et al.* 2008). Other studies have also shown a positive impact of counselling on IYCF practices. Some of these have been summarized in Table 2.

Table 2: Impact of Counselling on IYCF Practices

	Study	Outcome
Guise *et al. 2003*	The effectiveness of primary care-based interventions to promote breastfeeding: Systematic evidence review and meta-analysis	Antenatal education leads to significant increases in initiation rates (23%) and duration of short-term breastfeeding upto 3 mo., (39%).
Haider *et al.* 2002	Training peer counsellors to promote and support EBF in Bangladesh	Seventy percent of mothers in the project area breastfed exclusively as compared to only 6% of mothers in the control area who breastfed exclusively.
Lu *et al.* 2001	Provider encouragement of breastfeeding: Evidence from a national survey in US	Women who were encouraged to breastfeed by a health professional in the hospital were more than 4 times more likely to initiate breastfeeding as compared to women who did not receive encouragement. The

	Study	Outcome
		influence of provider encouragement was significant across all strata of the sample.
Morrow *et al.* 1999	Efficacy of home-based peer counselling to promote exclusive breastfeeding: a randomised controlled trial (Mexico City)	At 3 mo., post partum, EBF was practiced by 67% of six-visit, 50% of three-visit, and 12% of control mothers (intervention groups vs. controls, p<0.001; six-visit vs. three-visit, p=0.02). Duration of breastfeeding was significantly (p=0.02) longer in intervention groups than in controls, and fewer intervention than control infants had an episode of diarrhoea (12% vs. 26%, p=0.03).

5. Support for mothers in the community

Health workers do not always have the opportunity to ensure that mothers successfully establish breastfeeding. Mothers may give birth at home, or they may be discharged from a maternity facility within a day or so after delivery. Difficulties may arise in the first few weeks with breastfeeding, and later on when complementary foods are needed. Illness of infants and young children is often associated with poor feeding. Families and friends are usually a mother's main source of advice about feeding her children, but this advice is sometimes fraught by misconceptions.

Mothers need continuing support to maintain exclusive and continued breastfeeding, to implement other methods of infant feeding when breastfeeding is not possible, and to establish adequate CF when the child is 6 months of age and older (Aidam *et al.* 2005). If a child becomes ill, the mother may require skilled support from a health worker to continue feeding her child. This support can be provided by trained personnel in the community, and in various other settings, such as a primary care facility or a pediatric department in a hospital

There should be no missed opportunities for supporting feeding in any contact that a mother and child have with the health system, whether it involves doctors, midwives, nurses or community health workers. Lay or peer counselors who have the skills and knowledge to support optimal infant and young child feeding can also contribute to improved feeding practices (Haider *et al.* 2000). Collectively, all these providers should ensure a continuum of care from pregnancy through the postnatal period into early childhood. When they help a mother, they should also talk to other family members, showing respect for their ideas, and helping them to understand advice on optimal feeding. In addition, they can share information and create awareness about the importance of appropriate infant and young child feeding through other channels, for example, by involving school children or extension workers from other sectors. This multi-pronged approach to promote and support infant and young child feeding

has been shown to be effective in many settings (WHO 2003).

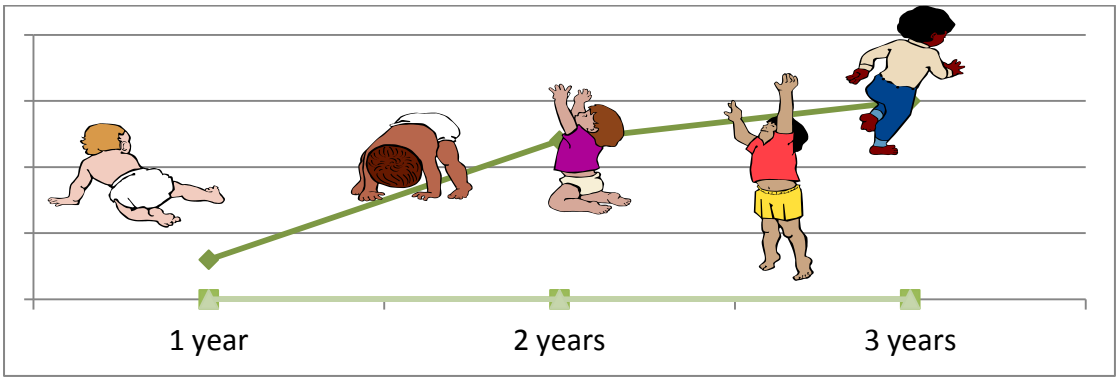
Box 3 summarizes key points of contact that mothers might have with a health worker who is knowledgeable and skilled to support her in practicing appropriate infant and young child feeding. Mothers who are not breastfeeding also need help with infant feeding at these times, and many of the skills needed by health workers to support them are similar.

Box 3: Key points of contact to support optimal feeding practices

- During antenatal care
- At the time of childbirth and in the immediate postpartum period
- In the postnatal period:
  - For healthy term babies on day 2–3, day 5–7, and around 3–4 weeks
  - For low-birth-weight babies more frequently: on day 2, day 3, day 5–7, day 14, and day 28
- At 6 weeks post partum for all mothers and babies
- During immunization contacts
- During well-baby clinics and/or growth assessment visits
- During sick child visits and their follow-up

C. Growth Monitoring and Promotion

The growth of a child is an indication of the state of his/her health, nutrition and well being and hence growth monitoring is a pillar of health care in children. Growth monitoring (GM) is the process of following the growth rate of a child in comparison to a standard by periodic anthropometric measurements in order to assess growth adequacy and identify faltering at early stages. Assessing growth allows capturing growth faltering before the child reaches the status of undernutrition (UNICEF 2008).



Growth monitoring is a screening tool to diagnose nutritional, chronic systemic and endocrine disease at an early state. It has been suggested that growth monitoring

has the potential for significant impact on mortality even in the absence of nutrition supplementation or education (Garner *et al.* 2000).

Monitoring the growth of a child usually requires taking the same measurements at regular intervals and seeing how they change. A single measurement only indicates the child's size at that moment; it does not give any information about whether a child's size or weight is increasing, staying the same, or declining. Careful repeated measurements and comparisons with previous measurements are necessary because most children will continue to grow a little, unless they are very ill, and it is easy to mistake some growth for adequate growth.

Growth monitoring and promotion (GMP) is thus a prevention activity that uses growth monitoring, i.e. measuring and interpreting growth, to facilitate communication and interaction with caregiver and to generate adequate action to promote child growth through:

- ✓ Increased caregiver's awareness about child growth
- ✓ Improved caring practices
- ✓ Increased demand for other services, as needed (UNICEF 2008).

GMP is widely used as a community based tool for child survival. The use of growth monitoring extends beyond problem detection; it has been used to provide a basis for communicating with mothers on child health and nutrition by stimulating the thinking about the causes of poor growth and malnutrition (ACC/SCN 1990a).

a) *Process*

The GMP process includes three stages: i) measuring and interpreting growth adequacy, ii) analysis of the reasons for adequate or inadequate growth, and iii) counseling; which corresponds to the triple-A approach i.e., Assessment, Analysis and Action (UNICEF 2007a).

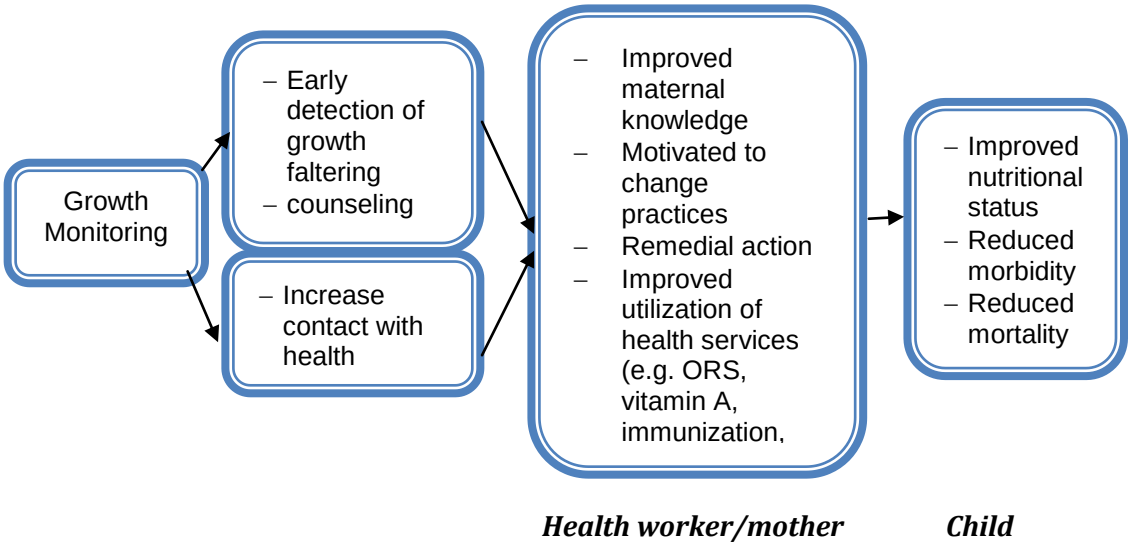
Growth monitoring is used to initiate communication with mothers and care givers concerning child health and nutrition, and to stimulate thinking about the causes of poor growth and malnutrition. This in turn led to action at the level of the household and of the community itself (Beaton *et al.* 1990).

Thus, as presented in Figure 13, effective GMP program should ensure, early detection of growth faltering, appropriate counseling and increase contact with health services, leading to improved nutritional status and reduced morbidity and mortality (UNICEF 2008).

The quality of implementation of GMP depends on five main activities linked with it which are (1) weighing accurately; (2) plotting on a growth chart; (3) interpreting the

growth curve; (4) discussing options with the care giver and agreeing on future action; and (5) evaluating the child's response (Ashworth *et al.* 2008).

Figure 13: Conceptual Frame work for an Effective GMP Program



b) *Objectives of Growth Monitoring and Promotion*

The main aims of growth monitoring, as originally conceived, are to (Ashworth *et al.* 2008);

(1) ***Provide a diagnostic tool*** for health and nutrition surveillance of individual children and to instigate effective action in response to growth faltering.

(2) ***Teach*** mothers, families and health workers how diet and illness can affect child growth and thereby stimulate individual initiative and improved practices.

(3) ***Provide regular contact*** with primary health-care services, and there by facilitate their utilization.

The underlying logic is that if growth faltering is detected early and is made *visible* to health workers and families, then families can respond by changing their child-care practices, provided they are offered proper motivation, given clear, feasible alternatives, and given a role in deciding what practices they will try to change (Griffiths 1981).

Subsequent objectives of growth monitoring that have developed include:

(4) ***Community mobilization***: Growth monitoring can serve as an entry point for community mobilization and social action, especially when growth monitoring data are aggregated and used for community-level assessment and analysis of child malnutrition. The premise is that caregivers' participation in growth monitoring will lead to increased awareness of factors that detrimentally affect children's health and that they will influence community leaders and citizens to take collective and effective

action to address underlying socio-economic causes of poor health and promote social and economic equity. This is in keeping with the Alma Ata Declaration of 1978 which emphasizes the need for community and individual participation in primary health care.

(5) ***Targeting supplementary feeding***: The weight chart is widely used to determine eligibility for entry to supplementary feeding programmes. The criterion is usually a weight-for-age below one of the reference curves on the weight chart, equivalent to 'moderate' underweight. This invariably shifts the focus of growth monitoring towards identifying children who meet this criterion, rather than intervening at the first sign of growth faltering. Consequently no action is taken until the child is significantly underweight. As health workers choose who should receive assistance, the collaborative involvement of families in decision making is lost, as well as any educational benefit of regular growth monitoring. Using weight charts in this way is thus contrary to the precept of growth monitoring. Anecdotal reports suggest that once enrolled in supplementary feeding programmes and approaching the exit criterion, some children may be purposely underfed so as to remain beneficiaries. Although supplementary feeding programmes may have their place in offsetting food shortage, growth faltering is often the result of poor feeding practices, which can still prevail even among beneficiaries of food distribution programmes.

(6) ***Reporting prevalence of underweight:*** Governments and agencies may require health workers to provide information on the extent of underweight in their locality, or the number of children failing to grow in a given month. Currently over 50% of countries transfer information obtained from growth monitoring to higher levels (de Onis *et al.* 2004). In some countries time-consuming procedures are devised, with information systems spanning village, district, provincial and national levels. In Vietnam, for example, it takes several days each month at district level to collect and aggregate village data in order to report to higher authorities the prevalence of underweight and coverage of child weighing (Shrimpton 2003). Weights may be recorded in logbooks and never plotted, and the growth chart may be used simply to determine if a child is underweight, sometimes at a later date instead of in the mother's presence. Thus, the promotive aims of growth monitoring are surrendered. Furthermore, the information submitted may not permit meaningful analysis and interpretation so that even the nutrition status surveillance objective may not be achieved.

c) *Benefits of Growth Monitoring and Growth Promotion*

The Growth monitoring program offers many benefits in strengthening preventive health program. Some of which are as follow (Ashworth *et al.* 2008);

- ✓ Small expenditure per child
- ✓ Best general index of the health of an individual child

The main anticipated benefits in developing countries are:

- ✓ Reductions in undernutrition, morbidity and mortality among young children. The regular measurement helps early detection of malnutrition associated with diarrhoea, and other illnesses, when remedial action is relatively easy.

Linked benefits are;

- ✓ Early intervention when growth faltering is more easily remedied
- ✓ Improved knowledge about the effect of diet and illness on growth
- ✓ Families motivated and enabled to take effective action
- ✓ Nutrition and health counseling tailored to individual needs
- ✓ Opportunity to assess remedial actions
- ✓ Greater self-reliance and self-esteem
- ✓ Greater utilization of preventive health-care services
- ✓ Fewer referrals for curative care; cost savings, and
- ✓ Communities mobilized to address underlying socio-economic causes of poor health.

d) *Issues with Growth Monitoring and Promotion*

However, there are also some problems associated with growth monitoring like

- Lack of understanding on the part of health workers about the role of growth monitoring; many existing training methods only look at teaching the skills of growth chart completion or checking it for errors;
- Lack of involvement of mothers in monitoring the growth and development of their children;
- Lack of commitment of senior health personnel to the monitoring of children's growth and development;
- Lack of planning and facilities when children with growth faltering are detected.

Even though simple in concept there are abundant difficulties with GMP and, as a result only 20% (35/178) countries contacted in 1998–2000 reported having no problems with the use of growth charts (de Onis *et al.* 2004) which is similar to the proportion (22%) reported in 1978 among health personnel contacted in 50 countries

(O'Brien and O'Brien1978).

The GMP issues with ICDS of India are no different than this. In an evaluation of 3704 rural children whose mothers were largely illiterate, analysis of covariance was used to control for socio-economic status and other programme services, and showed that growth monitoring did not have an impact on weight-for-age or morbidity (Gopaldas *et al.* 1990).

e) *Importance of Counseling and Training in Growth Monitoring and Promotion*

It is important to underscore that GMP without proper tailored counseling is not recommended. Counseling aides should include generic algorithms addressing assessment, analysis and action, with specific advice for different situations, linked to individual counseling tools to address each specific situation. The algorithms and counseling cards will need to be tailored to country contexts and based on formative research results. Counseling aides should include clear principles of effective counseling and negotiation. Importance of developing counseling skills should be emphasized.Training should include role play and practical sessions and should be followed up by regular coaching; mentoring and support to ensure good counseling skills are developed and applied. There needs to be a tool to record the negotiated decisions, actual implementation by the caretaker and subsequent follow up. Supportive supervision of counselors is crucial For sustainability, it is suggested to have individuals tasked by the national structures to perform this function (UNICEF 2008).

In Jamaica (Alderman *et al.* 1978) and Tamil Nadu (George *et al.* 1993), where intensive nutrition counseling was associated with improved nutritional status, health workers were trained for 8 weeks and Supervisory visits were frequent. Training and supervision were also emphasized in the projects in Nigeria (Cunningham 1978) and Narangwal (Kielmann *et al.* 1978).

Inadequate training of health workers, especially in equipping and enabling them to provide effective counseling, contributes to poor quality of implementation (Ashworth *et al.* 2008). Among various studies reviewed, there is a notable difference in the training of health workers. Little time was spent training in the poorly performing programmes – 3 days in BRAC (Karim *et al.* 1994) and no growth-monitoring training for AWWs in some projects in ICDS (Kapil *et al.* 1996). In contrast, those with good outcomes spent a considerable time training and supervising their health workers.

In Madagascar and Senegal (Marek *et al.* 1999), performance was closely

supervised: the indicators used were: (1) percentage of cohort children weighed monthly; (2) percentage of cohort caregivers attending weekly education sessions; and (3) percentage of cohort children who are malnourished. In Senegal, if performance targets were not met, the Supervisor was dismissed after a warning period.

Ideally, the counseling should address the specific needs of each mother and her child, which is impossible if health workers lack the necessary knowledge, skills and insight to analyse the situation and deduce appropriate action. In a survey of training courses in Lusaka, weighing, plotting and interpreting the growth curve were adequately taught, but none taught counseling or follow-up action (Msefula 1993). Too often there is insufficient investment in nutrition training. In the IMCI training, the nutrition component is sometimes reduced or not attempted because of time constraints, and so IMCI clinic staff may not be equipped for growth promotion.

Key messages (Ashworth *et al.* 2008);

- ✓ To be effective in reducing child malnutrition and mortality, growth monitoring must be accompanied by community-based health and nutrition interventions
- ✓ Growth monitoring and promotion programmes should prioritize infants and children aged 0–18 mo. and utilize all child health contacts for nutrition counselling
- ✓ Training, supervision and support for health workers must be improved if they are to be effective counsellors in growth promotion programmes
- ✓ Impact is dependent on coverage, intensity of contact, health worker performance, and adequacy of resources.

f) *Country Experience*

Indonesia

In Indonesia 2.5 million infants and young children are being weighed regularly at the traditional monthly meetings of village women. The results are entered on growth charts kept by the mothers themselves (UNICEF 1985).

Thailand

A programme based on the home use of growth charts by parents in several villages, helped to eliminate completely third degree malnutrition and reduce second degree malnutrition by 44% during 1981-1982, even though no additional food was provided

(Hendrata and Johnston 1978).

Jamaica

A systematic programme to improve the health and growth of over 6,000 young children using growth charts, immunization and nutrition education and milk supplements, resulted in a 40 per cent decline in the prevalence of malnutrition and a 60 per cent fall in infant mortality provided (Hendrata and Johnston 1978, Ashworth and Feachem 1986).

To conclude, the practical benefits of growth monitoring in promoting better nutritional status and child health are wholly dependent on effective follow-up action being taken by mothers and health workers. Thus growth monitoring program should ensure:

- ✓ Motivating mothers and enabled to acquire the necessary skills and resources to take required action
- ✓ Culturally appropriate advice should be given to mothers and care givers ensuring the local availability of resources
- ✓ Basic health services must be readily available, including the provision of vaccines, drugs and oral rehydration fluids.

Experience suggests that growth monitoring programmes are not always fulfilling these prerequisites and consequently are not achieving the desired impact on child health. It is feared that this could lead to a backlash of disillusionment with growth monitoring per se and it is therefore urged that growth monitoring should not be instituted unless the proper infrastructure is in place to permit effective follow-up action (Ashworth and Feachem 1986).

g) *Growth Measurements and Indicators*

Various body measurements are used to assess growth. Some are easier to use, more accurate and more useful than others. Growth measures are usually compared to a reference population. Western standards are usually used for comparison, such as Tanner and Boston, or the National Centre for Health Statistics (NCHS). WHO has recently brought out growth standards for children upto 19 years of age; that are currently in use.

There are three main anthropometric indicators for assessing the nutritional status of preschool children, weight for age, weight for height and height for age. The indicator used in the Integrated Child Development Services (ICDS) scheme is weight for age.

D. India's Integrated Child Development Services Program

The National Policy on Children in August 1974 of Government of India declared children as, "supremely important asset". This was followed by the launch of the scheme programme entitled Integrated Child Development Services (ICDS) scheme in 33 blocks of the country on 2nd October 1975. The programme aimed at providing an integrated package of services in a convergent manner for the holistic development of children in the country. Today, ICDS is the foremost symbol of India's commitment to her children – India's response to the challenge of providing pre-school education on one hand and breaking the vicious cycle of malnutrition, morbidity, reduced learning capacity, productivity and mortality, on the other. The ICDS programme provides integrated services of health, nutrition and early childhood education, with the following objectives:

- Improve the nutritional and health status of children in the age-group 0-6 years;
- Lay the foundation for proper psychological, physical and social development of the child;
- Reduce the incidence of mortality, morbidity, malnutrition and school dropout;
- Achieve effective co-ordination of policy and implementation amongst the various departments to promote child development; and
- Enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

The ICDS programme provides services through community-based workers, referred as *Anganwadi* workers (AWWs) and *Anganwadi* helpers. The services are provided from a centre called the '*Anganwadi*' which means "a courtyard play centre" which is located within the village itself. One AWW is appointed for 1000 population. For every 20-25 AWWs, there is an ICDS Supervisor. About 3-5 "ICDS Supervisors", appointed per ICDS project, cover a population of about a block. These Supervisors report to a project officer referred to as "Child Development Project Officers (CDPOs)". A package of the following six services is provided under the ICDS Project:

(http://wcd.nic.in/icds.htm)

i. Supplementary nutrition,
ii. Immunization,
iii. Health check-up,
iv. Referral services,
v. Pre-school non-formal education and
vi. Nutrition and health education.

The three services namely immunization, health check-up and referral are delivered through public health infrastructure viz. Health Sub Centers, Primary or Community Health Centers under the Department of Health and Family Welfare. Table 3 presents an overview of the services and target groups identified for each of the services as well as the target group. The services is expected to be universal and extended to all beneficiaries, irrespective of the income of the family.

Table 3: Target Groups and Service Provider

Services	Target Group	Services Provided By
Supplementary Nutrition	Children below 6 years; pregnant and lactating mothers	*Anganwadi* Workers (AWW)** and *Anganwadi* Helper (AWH)**
Immunization*		Auxiliary Nurse Midwife (ANM)# / Medical Officer (MO) #
Health Check-ups*		ANM / MO / AWW
Referral		AWW / ANM / MO
Pre-School Education	Children 3-6 years	AWW
Nutrition and Health Education	Women (15-45 years)	AWW / ANM / MO

*** ICDS workers, # health workers * AWW assists ANM in identifying and mobilizing*

ICDS is a centrally sponsored scheme wherein GOI provides 90% of the total programme cost to the state/UTs except the entire cost of supplementary food. Since 2009, the central and state government shares the cost of supplementary food in the ratio of 50:50. The Ministry of Women and Child at the central level is in-charge of the ICDS, while the basic responsibility for implementing the programme rests with the DWCD of the state government.

1. The ICDS Programme in Gujarat State

a) *Profile of Gujarat state*

The state has a population of 50,67,1017 and 26 administrative districts, 336 blocks (rural=233, urban=23 and tribal=80) and 18,618 villages (http://www.gujaratindia.com). Twelve districts are tribal with over 70% population being tribal and contributing to approximately 18% of the total population of the state. The ICDS scheme was launched in Gujarat in 1975 in Chhota Udeipur block of Baroda district**.** By 1978-80, 1205 AWCs were sanctioned. Upto 2003, Gujarat was the only state in the country with the state Health department being responsible for the implementation of health as well as ICDS programme. With such an administrative arrangement, effective coordination of the two programmes was

reported. Since 2003, the ICDS programme is managed by the DWCD and covers 5.2 million beneficiaries (children below 6 years, pregnant women, lactating mothers and adolescent girls) through 49,338 operational *Anganwadi* centers (as on March 2011).

b) *Supplementary Nutrition Program Support*

The Supplementary Nutrition Program (SNP) food is supplied to children in two forms - Energy dense micronutrient fortified extruded blended food (*Balbhog*) as Take Home Ration (THR) to children 6 months to 3 years.(7 packets per month) and hot cooked meals for older children 3 to 6 years .

Balbhog for children 6 months to 3 years

Balbhog is a comprehensive supplement that has potential to fulfill significant part of child's nutritional needs for optimal growth. *Balbhog*, a Micronutrient Fortified Extruded Fortified Blended Food product – (EFBF), is made out of wheat, bengal gram, edible oil, sugar and defatted soybean with addition of selected micronutrients.

Picture 1: Child below three with Packet of *Balbhog*

The Table 4 presents the compositions and Nutrient Content of *Balbhog* per daily portion of 125 grams which is provided to every child between 6 months to 3 years. Daily intake of *Balbhog* provides 33% of the recommended allowance (RDA) of calories, about 50% RDA of proteins and around 60% RDA of iron. *Balbhog* when consumed, in addition to food provided at home, results in ensuring adequate intake of various essential nutrients.

Balbhog has good flavor and pleasant smell. The product has been found to be suitable, palatable, acceptable, culturally by all blocks and districts of Gujarat. Different flavors, such as banana and vanilla, are used every three months. Shelf life is minimum 4 months under normal condition.

Balbhog is delivered in 500 gm packets. Seven packets per child per month are given to a child 6 months to 3 years. Additionally underweight children 3 to 6 years are also supplied 4 packets per month free of cost on the *MAMTA DAY*(Village Health and Nutrition). At the AWCs, for ensuring timely initiation and optimum complimentary feeding, *Balbhog* is advised to be distributed weekly. Mother is expected to collect weekly ration of THR in easy to carry packets of *Balbhog* and are encouraged to

prepare THR food as per the taste of a child.

Table 4: Composition and Nutrient Contents of *Balbhog* * Supplied by ICDS

Sr. No.	Ingredients	Per 125 gm	Micronutrient Fortification	*Balbhog* (125 gram)
1	Wheat	50 gm	Protein (gram)	12 - 15
2	Bengal Gram	15 gm	Calories (Kcal)	500
3	Defatted Soybean	10 gm	Iron (mg)	6
4	Edible Oil	15 gm	Vitamin A (mcg)	200
5	Sugar	35 gm	Calcium (mg)	200
			Thiamine (mg)	0.30
			Riboflavin (mg)	0.35
			Niacin (mg)	4
			Vitamin C (mg)	15
			Free Folic Acid (mcg)	15

** Based on revised Nutrition Norms vide letter No. 5-9/2005-ND-Tech Vol. II dated 24.2.2009*

Picture 2: AWW Demonstrating Various Recipes for Preparation of Complementary Food using *Balbhog*

The ICDS functionaries have been trained on significance and preparation of food items from *Balbhog* for young children. Mothers are briefed on the usage of *Balbhog* to facilitate mothers to feed their children any time of the day.

c) *MAMTA Abhiyan (Malnutrition Assessment and Monitoring to Act) - Initiative by Government of Gujarat, Health and ICDS Department*

Followed by a state level symposium on Malnutrition held in May 2006, the State Government launched "*MAMTA* (Malnutrition Assessment and Monitoring to Act) *ABHIYAN*" on 25th July 2006. The strategy of *MAMTA* Abhiyan is a joint initiative of ICDS and Health (RCH) sector. The four components include;

- *MAMTA Divas* (Village Health and Nutrition Day-VHND)
- *MAMTA Mulakat* (postnatal care home visit)
- *MAMTA Sandarbh* (referral and services)

- *MAMTA Nondh* (Record and Reports)

MAMTA Divas

MAMTA Divas, also known *as* "Village Health and Nutrition Day", is the key activity of *MAMTA Abhiyan* which is observed on the fixed day of immunization sessions across the state. A comprehensive package of maternal and child services ranging from immunization, antenatal care (ANC) services including hemoglobin testing, growth monitoring, free supply of 1.5 kg of iodized salt are provided on this day which is jointly organized by Health workers, ICDS workers, various village volunteers like *Gram Mitra*, *ASHA*, Members of *Mahila Mandal*, *Sarpanch*, local NGOs etc. The *MAMTA DAY* focuses on quality services, behavior change and community participation and social mobilization. For appropriate implementation of these activities, block level joint training of Health and ICDS functionaries is organized.

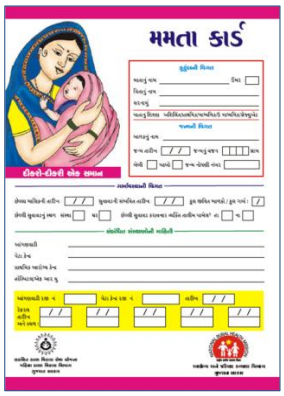
The major focus of *MAMTA DAY* (VHND) is GMP and counseling on IYCF practices which are expected to bring about change into the IYCF practices of parents and caregivers and eventually prevention and reduction in malnutrition.

Picture 3: *MAMTA DAY* Celebration in a Village of Gujarat

For promotion of maternal child care practices, including growth monitoring, the following two important tools are used on *MAMTA DAY*;

MAMTA Card

It is a comprehensive tool for recording; reporting and tracking of health care service utilization from pregnancy to child immunization (Picture 4:). It is also an IEC tool providing information on danger signs of pregnancy and early childhood care during pregnancy and childbirth as well as measures to be undertaken for a healthy motherhood and healthy child. For monitoring of child growth and malnutrition reduction, it



Picture 4: *MAMTA* Card

has a very important component of growth monitoring chart along with messages on IYCF. A section on maternal weight record is also included in the *MAMTA* card.

Community Growth Monitoring

The key focus of *MAMTA DAY* is to monitor nutritional status of children below 3 years of age and adequate dialogue with the mothers and care givers on IYCF for improved child care behaviors.

Picture 5: Community Growth Monitoring on *MAMTA DAY*

Besides individual growth monitoring and counseling, community growth monitoring activity is conducted quarterly on *MAMTA DAY*. A growth chart (Picture 5) with weight-for-age of community children is plotted and used for discussion with mothers and community members. The major objective of community growth monitoring is to;

- ✓ Create awareness among community leaders on situation of undernutrition in children in their area
- ✓ Initiate discussion on infant and young child feeding practices among parents and care givers
- ✓ Generate support for mothers and children from family and community.

Community Growth Monitoring aims to change the way parents and the community perceives the nutritional status of their children and shift the focus towards a scientific way of monitoring child growth. Such regular growth monitoring exercise also provides an opportunity for interaction with caregivers on various health and nutrition issues.

MAMTA Sandarbh (Referral)

Referral services are provided through one *MAMTA* referral centre developed in each block. Services of pediatrician who has been commissioned on a call basis are available on a fixed day mostly Thursday. Children with acute and chronic illnesses are screened and taken care at this centre.

MAMTA Mulakaat (Visit)

Three post natal visits are conducted by ICDS/health worker on days 1, 3 and 7 after birth of a child. Mothers are supplemented with postnatal vitamin-A supplement (2 lakh IU) on the first visit and provided counseling on child care and EBF on all the three visits.

MAMTA Nondh (Record)

This pertains to actions taken on specific days for updating records of the activities undertaken under *MAMTA Abhiyan*. Data is compiled and block-wise data is reviewed for actions with special focus on poor performing blocks.

d) *Integrated Management of Neonatal care and Childhood illnesses*

Gujarat is the first state in India to scale up Integrated Management of Neonatal care and Childhood illnesses (IMNCI) implementation to the entire state. The objectives of the IMNCI are to reduce morbidity and mortality among under five children i.e. reduce NMR, IMR, U5MR, prevent morbidity, prevent case fatality from diarrhea, pneumonia, and malaria. IMNCI also stresses on growth monitoring of below five children and promotion of appropriate breastfeeding and CF practices to prevent malnutrition.

2. Child Nutrition in ICDS

The ICDS program is potentially well-poised to address some of the underlying causes of persistent undernutrition, identified in the framework in Figure 8.

Table 5: Range of Services Offered by ICDS to Children Under Six Years

	Children Under 6 years
Health check-ups and treatment	Health check-ups by AWW, ANM, LHV Treatment of diarrhoea De-worming Basic treatment of minor ailments Referral of more severe illnesses
Growth Monitoring	Monthly weighing of under threes Quarterly weighing of 3-6 years old Weight recorded on growth card
Immunization	Immunization against poliomyelitis, diphtheria, pertusis, tetanus, tuberculosis and measles.
Micronutrient supplementation	IFA and Vitamin A supplementation for malnourished children
Supplemental Nutrition	Hot meal or ready-to-eat snack providing 300 calories and 8-10g protein. Double Rations for malnourished children
Preschool education	Early childhood care and preschool education (ECCE) consisting of "early stimulation" of under threes and education "through the medium of play" for children aged 3-6 years

Source*: DWCD 2004, available at http://wcd.nic.in/icds.htm*
Note*: In practice, not all of these services are necessarily provided at every AWC*

The program adopts a multi-sectoral approach to child well-being, incorporating health, education and nutrition interventions (Table 5), and is implemented through a network of *Anganwadi* centers (AWCs) at the community level. The Department of DWCD emphasis on a "life-cycle approach", meaning that malnutrition is fought

through interventions targeted at unmarried adolescent girls, pregnant women, mothers and children aged 0 to 6 years.

However, while ICDS has the potential to address many of the underlying causes of malnutrition, there are a number of mismatches between design and implementation within the program (especially with respect to targeting), as well as some serious problems with the quality of implementation.

The ICDS program has been the subject of a large volume of research. Most evaluations have focused on the quality of infrastructure and inputs, and the execution of activities. There have been few rigorous evaluations of the program's impact on nutritional status or health behaviors, partly because there are few sources of data that permit the comparison of outcomes among recipients and non-recipients of the program. Consequently, many authors have been unable to use the statistically rigorous methodologies that would enable them to draw more reliable conclusions about the impact of ICDS. As a result, some studies have found that the program is associated with improvements in nutritional status, while other studies have failed to find a positive effect.

The major national-level study of program impact (NIPCCD 1992) found that the prevalence of underweight was lower among children in areas with the ICDS program in place than elsewhere, for both children under-three[2] and children aged 3 to 6 years, but given the sample sizes of the control and treatment groups both these differences are statistically insignificant (Lokshin *et al.* 2005).

Three studies estimate the association between having an *AWC* in a village and the likelihood that a child is underweight, and find little or no association between the presence of an ICDS center and child nutritional status. Using multivariate analysis of the 1992/93 NFHS data, the World Bank estimates that, for boys, having a local ICDS center is associated with a 5% reduction in the likelihood of being underweight, but that there is no significant association for girls (Deolalikar 2005**)**. Using both the 1992/93 and the 1998/99 NFHS data, Lokshin *et al.* (2005) find that the program appears to have a significant and positive effect on nutritional outcomes. However, on more rigorous exploration, using propensity score matching techniques, they found little significant effect when children in ICDS villages are compared with children with similar demographic, household and were village characteristics in non-ICDS villages.

In a multivariate model of cross-sectional data collected in Kerala, Rajasthan and

[2] The prevalence of underweight was 29.2% where the program was in place, compared with 32.3% elsewhere

Uttar Pradesh between 2000 and 2002, Bredenkamp and Akin (2004) found that children who lived in villages with *AWC* were not significantly less likely to be underweight or ill than other children. When using data on actual attendance at *AWCs* in six states, it was found that only Kerala was this significantly associated with better nutritional status.

3. Feeding and Caring Practices in ICDS

ICDS appears to have had little success in encouraging mothers to adopt appropriate child care and feeding behaviours (including practices related to breastfeeding, weaning and diet) that have the potential to improve child growth and health outcomes. Data from Kerala, Maharashtra, Rajasthan and Uttar Pradesh yield very little evidence that these healthy behaviours are more common in villages with AWCs than without AWCs (Bredenkamp and Akin 2004). The AWW should devote much more of her time and energy to communicating the importance of EBF and, later, adding semi-solid complementary food three to four times a day in appropriate quantities thereafter (Ghosh 2004).

Growth Monitoring and Promotion in ICDS

There have been marked improvements in anthropometric status since 1975, which have been attributed to the ICDS programme (Kapil and Pradhan 1999), but these might reflect a secular trend. Comparisons of ICDS and non-ICDS blocks show statistically significant differences in moderate and severe malnutrition, although the differences from a public health perspective are small, the proportions <75% weight-for-age being 27% and 30% for ICDS and non-ICDS blocks respectively (Avsm *et al.* 1995).

Growth monitoring activities are hampered by poor access to appropriate equipment, such as weighing scales, growth cards and wall or book charts. Often the equipment is nominally present, but not of sufficient quantity or quality. AWCs in Kerala and Madhya Pradesh, while also experiencing equipment shortages, are generally better-equipped than those in the other three states i.e. Maharashtra, Uttar Pradesh and Chattisgarh. Even in AWCs with working scales, many AWWs report that they do not weigh young children (under three) every month. In all states, growth-monitoring performance appears to be superior in tribal areas, where children are weighed with greater frequency, and AWCs in urban and tribal areas are better-equipped with weighing equipment than rural AWCs.

Even with regular weighing, growth monitoring is effective only if accompanied by communication for behavior change that results in improved growth of the malnourished child. Previous studies of ICDS have noted that this does not often

occur, perhaps because many AWWs are not fully competent with respect to the interpretation of growth cards/curves (Gopalan 1992) or because AWWs fail to effectively communicate the meaning of children's growth patterns to mothers (Vasundhara and Harish 1993). Indeed, the ICDS III baseline/ICDS II end line survey reveals a very large discrepancy between the child's measured weight and the mother's subjective assessment of her child's growth status: in Kerala, all mothers think that their children are experiencing normal growth, and in Uttar Pradesh where underweight prevalence in the ICDS III baseline/ICDS II end line sample is 46%, 94% of women describe their children's nutritional status as "normal" (Bredenkamp and Akin 2004). NFHS-3 showed that mothers of only half of the children age 0-59 months who were weighed received counseling services from an AWC after their child was weighed (NFHS-3 2007).

E. Research Question

Child malnutrition is mostly the result of inappropriate infant and young child feeding and caring practices, and has its origins almost entirely during the first two years of life (Shrimpton *et al.* 2001).

GMP alone is not sufficient to address undernutrition at the community level, and it addresses only a narrow range of the causes of undernutrition. To address the problem of undernutrition, comprehensive nutrition programs should be implemented based on causal analysis within the nutrition conceptual framework, where GMP can serve as a platform for these programs.

The persistent high levels of child undernutrition in India are the consequences of a complex interaction of basic, underlying and immediate factors (see, for example, the theoretical frameworks of Mosley and Chen 1984 and UNICEF 1990). While any single intervention cannot address such a complexity of determinants, India depends heavily on the package of services provided by Integrated Child Development Services (ICDS) to address the problem of undernutrition to addressing the immediate causes of undernutrition, namely, inadequate dietary intake and childhood infection. It is a well-designed intervention and is an appropriate response to the problem of undernutrition in India (Gragnolati *et al.* 2006).

Educating mothers on correct breastfeeding practices and child nutrition in the community is one of the components of the ICDS programme in India, in which the ICDS AWWs and their Supervisors needs to play vital role, to promote community based optimal IYCF practices.

Weaknesses in ICDS programme delivery, including incorrect weighing and plotting

(Kapil *et al.* 1996), failure to identify children with growth-faltering and lack of nutrition counseling, have been reported (Lalitha and Standley 1988, Gopaldas *et al.* 1990) and might explain the programme's lack of impact. Also participating children tended to be older than 18 months and thus had passed the critical period when interventions to prevent growth faltering are most effective (Shrimpton *et al.* 2001).

The 11th Five-Year Plan paper on "Strategies for Children under six" states that; "an essential element for securing better operational results is better capacity building. Training, both initial ("pre-service") as well as ongoing ("in-service"), is usually recognized as an important component of programme implementation. The current training system appears to be quite divorced from field reality and practitioner experience. Building more lively and effective training programmes, linked with ground realities, would require building crucial linkages between training, programme implementation and review, and child development knowledge and practice" (GOI 2007).

In Gujarat, the major focus of *MAMTA DAY* (VHND) is growth monitoring and promotion, and counseling on IYCF which is expected to bring about change in the IYCF practices of parents and caregiver and eventually reduction in malnutrition. The ICDS AWWs plays a vital role in this effort to prevent and reduce undernutrition.

The study aimed at answering the following research question; whether capacity building of ICDS functionaries, on growth monitoring and promotion, and infant and young child feeding practices can bring about a required change in the infant and young child feeding practices of parents and care providers, and eventually a reduction in undernutrition among children under two years of age?

The next chapter (chapter 3) describes the scope of investigation based on the review of literature and research question.

CHAPTER 3: SCOPE OF INVESTIGATION

The present study was undertaken with the **broad objective**:

- To build the capacity of *Anganwadi* workers of ICDS scheme on growth monitoring and promotion, and infant and young child feeding, and to assess its impact on infant and young child feeding practices and nutritional status of children under two years.

Specific Objectives:

1. To assess the knowledge and perceptions of *Anganwadi* workers with regard to growth monitoring and promotion and infant and young child feeding practices, among selected rural *Anganwadi* centers' of Vadodara district.
2. To assess the prevalence of undernutrition and associated Infant and young child feeding practices of care providers of children under two years.
3. To build the capacity of *Anganwadi* workers' on growth monitoring and promotion and infant and young child feeding in two stages:
    a. Formal Capacity Building – Group training
    b. Hands-on Capacity Building – Individual on-the-job training
4. To assess the impact of capacity building on knowledge and perceptions of *Anganwadi* workers' with regard to growth monitoring and promotion, and infant and young child feeding practices.
5. To assess impact of capacity building on undernutrition prevalence and associated infant and young child feeding practices of care providers of children under two years

The methods and material used for the above research are presented in the next chapter (Chapter 5).

CHAPTER 4: METHODS AND MATERIALS

The current chapter gives details about the methodology adopted for the study. It also discusses about the tools used for data collection and analytical framework used for the analysis of data.

The details of the study design, the tools and methods used for data collection, ethical aspects and statistical analysis are presented under the following sections:

A. Study Design
   1. Site of the Study
   2. Sample Selection
   3. Study phases

B. Tools and methods used for data collection
   1. Qualitative methods
      a) In-depth interviews
      b) Semi-Structured Interview
      c) Non-participant Direct observations
   2. Quantitative methods
      a) Anthropometric measurements

C. Ethical aspects and confidentiality

D. Statistical analysis

A. Study Design

The study was initiated after obtaining official permission from the ICDS District Program officer. The study was an operational research, with a focus on building the capacities of the *Anganwadi* workers (AWWs) of the ICDS on growth monitoring and promotion (GMP), and infant and young child feeding practices (IYFC) for children under two years of age.

1. Site of the Study

In April 2008, the ICDS program in Gujarat covered a population of around 3.89 crore having around 2.8 million beneficiaries (children under 6 years, pregnant women, lactating mothers and adolescent girls) through 44,179 operational *Anganwadi* Centers (AWCs). The State had 260 ICDS projects (193 rural, 52 tribal, and 15 urban), spread over 25 talukas of the state. Each project had approximately 3 to 5 ICDS Supervisors covering around 20-25 AWCs, each having a population of about 1000. For the current study, all children under 2 years of age in the Vadodara district

were the universe of study.

The ICDS in the district of Vadodara covered a population of 2.3 million and around 0.16 million beneficiaries through 15 ICDS projects. One of the projects of Vadodara district was in Waghodia block, which covered a population of around 11,22,632 through 116 of 119 sanctioned AWC's. Waghodia block was divided into 6 ICDS Supervisors groups know as '*Seja'* (Sectors), falling under 2 Primary Health Centers'. All S*eja* of Waghodia taluka formed the sampling frame. For the present study, two *Seja* with similar nutrition profile (27% and 28%), and weighing efficiency (90% and 92%) for children under three years as per the Monthly Progress Report (MPR) April 2008 were purposively selected as Intervention group (IG) and Control group (CG) respectively.

2. Sample Selection

The primary objective of this study was to measure the impact of capacity building on undernutrition prevalence and IYCF practices. All children under 2 years, approximately 750 per *seja* i.e. approximately 1500 children, at the time of survey (baseline and post capacity building) formed the main units of observation.

a) *Primary Outcome Measure: IYCF Practices*

For measuring the change in IYCF practices the sample size was calculated separately, to study the change in exclusive breastfeeding rates (EBF) from children under six months and to study the change in the three IYCF practices from children 6 to 23 months The percentage of children fed with the three appropriate IYCF practices was calculated on a basis similar to the National Family and Health Survey (NFHS)-3 i.e., breastfeeding status, the number of food groups and the number of times the child was fed during the day and night preceding the survey.

The initial proportion of EBF and IYCF practices was estimated from NFHS-3 (2005-06) prevalence for Gujarat. To measure 20% improvement in EBF (47.8% to 67.8%) and 15% improvement in IYCF practices (20.1% to 35.1%) at 80 power, 95% CI sample size required was 120 children under 6 months. and 170 children between 6 to 23 months[3] i.e. total 290 children between 0 to 2 years (NHFS-3 2007 and Epi Info 6.04d). This included an additional 10% to take care of possible dropouts (incomplete information) from the study.

For obtaining a sample size of 120 children under 6 months, all the children under 6 months available at the time of survey were assessed. For getting a total sample size

[3] Age groups are described in intervals of months completed. For example, infants 0–5 months of age have completed 5 months but are less than 6 months (or 183 days) old.

of 170 children between 6 to 23 months, a random number list was generated using Epi Info 6.04d. In situations where the child was not available for anthropometric measurements and/or the mother was not available, the child as per the random number list was replaced for the interview by the next available child.

Additionally a cohort of pregnant women in last trimester (7 to 9 mo. gestation) was enrolled at the baseline from both the *Sejas*. The nutrition status and feeding practices of the children born to the cohort of pregnant women enrolled at baseline was studied, covering around 55 pregnant women from each *Seja*.

b) *Secondary Outcome Measure: Undernutrition Prevalence*

All children under two years in the study population {~ 1500 children (~ 750 per *Seja*)} were studied for anthropometric measurements (Height, Weight and MUAC) during baseline and post data collection as secondary outcome measures.

3. Study Phases

The entire study was divided into following five phases.

Phase I: Baseline Data Collection

The objective of baseline data collection was to assess undernutrition prevalence and associated IYCF practices of care providers of children below 2 years, and to assess the knowledge and perceptions of *AWWs* and Supervisors with regard to GMP, and IYCF practices. For this the data was collected through house to house survey. Overall the baseline data collection consisted of three parts.

a) *Anthropometric Measurements: Children Under Two Years and Pregnant Women*

Through house to house survey all the children below 2 years in all the AWCs of both the *Sejas'* were covered. The full name of child, date of birth, address (street and village name) along with anthropometric measurements (Health, Weight and MUAC) of all children under two years of age was noted.

Additionally during the house to house survey pregnant women in last trimester of pregnancy were also enrolled into a cohort and anthropometric measurements, including height and weight, was taken and noted to correlate with pregnancy outcome.

b) *Knowledge Attitude and Practices of Care Providers of Children Under Two Years and Pregnant Women on IYCF and GMP*

During the house to house survey, a total of 290 care providers of children (U-2

years), selected as per random number generated using epi_info, were approached for interview using pretested semi structured questionnaire (SSQ) (Annexure 1)**.** The interview lasted for around 20 to 25 minutes and covered questions related to various indicators directly and indirectly related to undernutrition in children under two years of age, GMP, IYCF practices and related ICDS services, as mentioned in Table 6:.

Table 6: Indicators for Baseline Data Collections – Semi-structured Interview

Indicators	Mothers of Children			Pregnant Women
	0 to 6 mo.	6 to 12 mo.	12 to 23 mo.	
Socio economic status	√	√	√	√
IYCF practices	√	√	√	
Receipt of counseling on Breastfeeding Practices	√	√		
Receipt of counseling on complementary feeding practices	√	√	√	
Knowledge on Breastfeeding Practices	√	√		√
Knowledge on complementary feeding practices	√	√	√	
ANC and delivery details of mothers	√	√		
Growth Monitoring and Promotion	√	√	√	
Disease profile	√	√	√	
Immunization Status	√	√	√	
Micronutrient Supplementation		√	√	
Service Utilization - *MAMTA DAY*	√	√	√	√
Service Utilization - Supplementary Nutrition		√	√	
Sanitation and Hand-washing	√	√	√	√

c) *Knowledge And Perceptions of Service Providers on IYCF Practices and GMP*

Total 19 AWWs of IG, 17 AWWs of CG and their respective Supervisors (one each) were evaluated for their knowledge and perceptions of IYCF and GMP using an open ended questionnaire (Annexure 2).

Phase II: - Development of Training Module and Tools

For capacity building of ICDS AWWs the following tools were identified to be required during intervention.

1. New born and Salter scale
2. *MAMTA* card (Health and Nutrition Card issued by ANM on registration of

pregnancy, covering all health and nutrition services from ANC to GMP till 3 years)

3. Community growth chart
4. Growth chart register
5. Flip charts on IYCF practices
6. Reference module on IYCF

The tools 1 to 4 were already provided by Health and ICDS department as a part of *MAMTA DAY* (Village Health and Nutrition Day - VHND). The flip charts (adapted from UNICEF flip chart) and training module were developed by the researcher. The training module was adapted in line with the BPNI training module for front line workers with inputs from IG Supervisor (Annexure 3).

The flip chart used by UNICEF in Valsad Gujarat, was pretested and modified as per AWWs requirement and given to all AWWs of IG (Annexure 4). It was ensured that all 6 tools were available with all AWWs of IG. The CG continued using the tools already available with them.

Phase III: - Capacity Building of AWWs of IG on GMP and IYCF practices

After the completion of baseline survey and development of training tools and material, the capacity building of AWWs of IG was planned, with the objective to build the capacity of AWWs on GMP and IYCF. The capacity building was conducted in two ways, first was a formal training addressing all AWWs of IG at the same time, and followed by on-the-job capacity building. The techniques used for capacity building were lectures, discussion and practical sessions, demonstrations and on-the-job training. Through role plays, discussion and on-the-job training, focus was to enhance the counseling skills of AWWs and prioritize the GMP and IYCF counseling on *MAMTA DAY* and during home visits. The AWWs were trained by researcher on when and how to counsel and what kind of messages to give to different beneficiaries and their family member depending on the duration of pregnancy, age of child and nutrition status of child. The AWWs were trained to focus counseling on the following areas for the respective age groups.

- Pregnant women in 3rd trimester – Early Initiation of Breastfeeding (EIBF) and EBF
- Mothers with 0-3 months old child – EBF
- Mothers 4-6 months old child - EBF and initiation of CF on completion of 6 months.
- Mothers 7–12 months old child - CF and continuation of breastfeeding till 2 years of age and beyond.

Additionally the AWWs were also trained by researcher on, counseling of parents and care providers on use of ready-to-eat (RTE) take home food along with distribution the RTE packets on *MAMTA DAY* and during home visits.

a) *Formal Capacity Building – Group Training*

The first capacity building was group training held for three days. This was followed by capacity building in monthly review meeting through review, discussion and role play for the next 6 months. At the end of 6 months, half day reinforcement of the capacity building was conducted. The details about the capacity building attended by each AWW in the IG are presented in Annexure 5.

Group Training: This was held for three days, using lectures, discussion, demonstrations and practical sessions. The training was given by the researcher and the ICDS Supervisor. The topics covered during capacity building included the following:

- Diet during pregnancy and lactation
- Growth monitoring and promotion
- Infant and young child feeding practices
- Use of tools - Community growth chart, flip cards on IYCF and GMP tools
- Home visits of malnourished children
- Interpersonal communication (IPC) skills

Monthly Review and Discussion: During the monthly review meeting the researcher covered issues identified by Supervisor during routine visits and the researcher during field visit from on-the-job capacity building. Further, the queries and problem encountered by AWWs in counseling the mothers and care providers of children under two years on IYCF and conducting GMP activity were addressed. Further during the capacity building held with monthly review meeting, comprehensive and effective messages on IYCF and GMP were developed on the following (Annexure 6).

- EIBF and EBF– Pregnant women in last trimester and their family members
- EBF for first 6 months –parents and care providers of new born and children under 6 months
- Initiation of CF on completion of 6 months and continuation of breastfeeding till 2 years and beyond-to the parents and care providers of children 7 months onward.

These messages were used by AWWs for counseling the pregnant women and mother of children under two years of age on GMP and IYCF. Eventually guidelines for *MAMTA DAY* and home visits with special focus on counseling on GMP and IYCF

were developed.

Reinforcement of Capacity Building: During the one day reinforcement of the capacity building, the guidelines for *MAMTA DAY* and home visits with special focus on counseling on GMP and IYCF (Annexure 7) were shared by the researcher with all AWWs.

The topics covered during capacity building included the following:

- Revision of plotting on *MAMTA* card and new growth chart register
- Revision of key action points with focus on IYCF and GMP on
    - *MAMTA DAY*
    - Home visit
    - Counseling of children above six months on breastfeeding and CF
- Role play on
    - Counseling of pregnant women on EIBF
    - Home visits of New born with focus on breastfeeding assessment and counseling
    - Growth monitoring and promotion on *MAMTA DAY* with *Balbhog* distribution
    - Counseling on initiation of CF and continuation of breastfeeding till 2 years
    - Home visits of malnourished children

This guideline was given to assist the AWWs to continue working with pregnant women and parents of children below 2 years of age on improving IYCF practices and prevention of undernutrition, under the guidance of their Supervisor thereafter.

b) *Hands-on Capacity Building - Individual On-the-Job Training*

For the hands-on capacity building of AWWs, the researcher ensured that at least one *MAMTA DAY* and one routine day of each AWW was attended. The approach was assisting AWWs to enhance their skills for effectively implementation of activities related to GMP and promoting of optimal IYCF practices. The hands-on capacity buildings of AWWs were conducted from June 2009 to November 2009. Overall, 17 *MAMTA DAY*s and 32 routine days of AWWs were observed by researcher in duration of 6 months (Annexure 5).

A pretested standard check list was used to note the observation during visit. At the end of the visit, the observations as well as the queries and problems of AWWs were discussed. Focus was on effectively improving the counseling skills of AWWs and the kind of messages which were to be given to the families. These messages would have an impact on knowledge, attitude and practices of parents related to IYCF practices and eventually nutrition status of the children under two years of age. All

the important issues identified during on-the-job capacity building were discussed by the researcher with all AWWs during the capacity building meeting held with the monthly review meeting.

The Supervisor was already trained by ICDS in 2007. Further the Supervisor actively participated in tool and module development, as well as assisted in all the formal capacity building. The Supervisor observed the AWWs counseling pregnant women and parents of children under two years of age on IYCF and GMP, as well as assisted them in improving their capacity with this regard. The Supervisor reported 22 field visits with special focus on capacity building of AWWs of different AWCs.

Phase IV: - Implementation by ICDS AWWs after Capacity Building

With guidelines, flip charts and messages on GMP and IYCF practices shared during the capacity building, the AWWs and ICDS Supervisor continued GMP and IYCF counseling of care providers of children under two years of age and pregnant women on *MAMTA DAY*, routine days and during home visits for a period of 6 months The entire population under the ICDS AWCs of intervention group was thus covered for a total period of 1 year including 6 months during capacity building and 6 months after the last reinforcement of the capacity building.

Phase V: - Assessing the Impact of the Capacity Building

The impact assessment was planned with the following objectives

- To assess the impact of capacity building on knowledge and perceptions of *Anganwadi* Workers' with regard to GMP and IYCF practices.
- To assess impact of capacity building on undernutrition prevalence and IYCF practices of care providers, of children under two years.

For the above objectives, the post data collection was planned on similar lines of baseline data collection.

Additionally, other than the in-depth interviews of AWWs on knowledge and perceptions like baseline, the concurrent assessments was also done to assess the on-the-job GMP and IYCF counseling skills of AWWs of both the groups i.e. IG and CG.

Process Evaluation by Concurrent Assessment

After the capacity building was completed, process evaluation of field practices related to GMP and IYCF was planned through concurrent assessment for a period of 6 months. In the concurrent assessment data was obtained using observations and the monthly progress reports of the AWWs.

Observations: To assess on-the-job GMP and IYCF counseling skills of AWWs of both the groups during *MAMTA DAY*s, routine days and home visits, the AWCs were visited on *MAMTA DAY*s and routine days and the observations were noted using standardized checklist (Annexure 9 and Annexure 10)**.**

Review of Monthly Progress Report of ICDS: The ICDS AWWs report the nutritional status of all children under 6 years in their monthly progress report (MPR). The data is reported separately for children 0 to 6 months, 7 to 12 months and 12 to 36 months. The data of all AWCs (19 IG +17 CG) was collected every month from April 2008 to April 2010. The data was primarily used for observing the change in weighing efficiency and change in nutritional status of children in the respective groups.

Post data collection

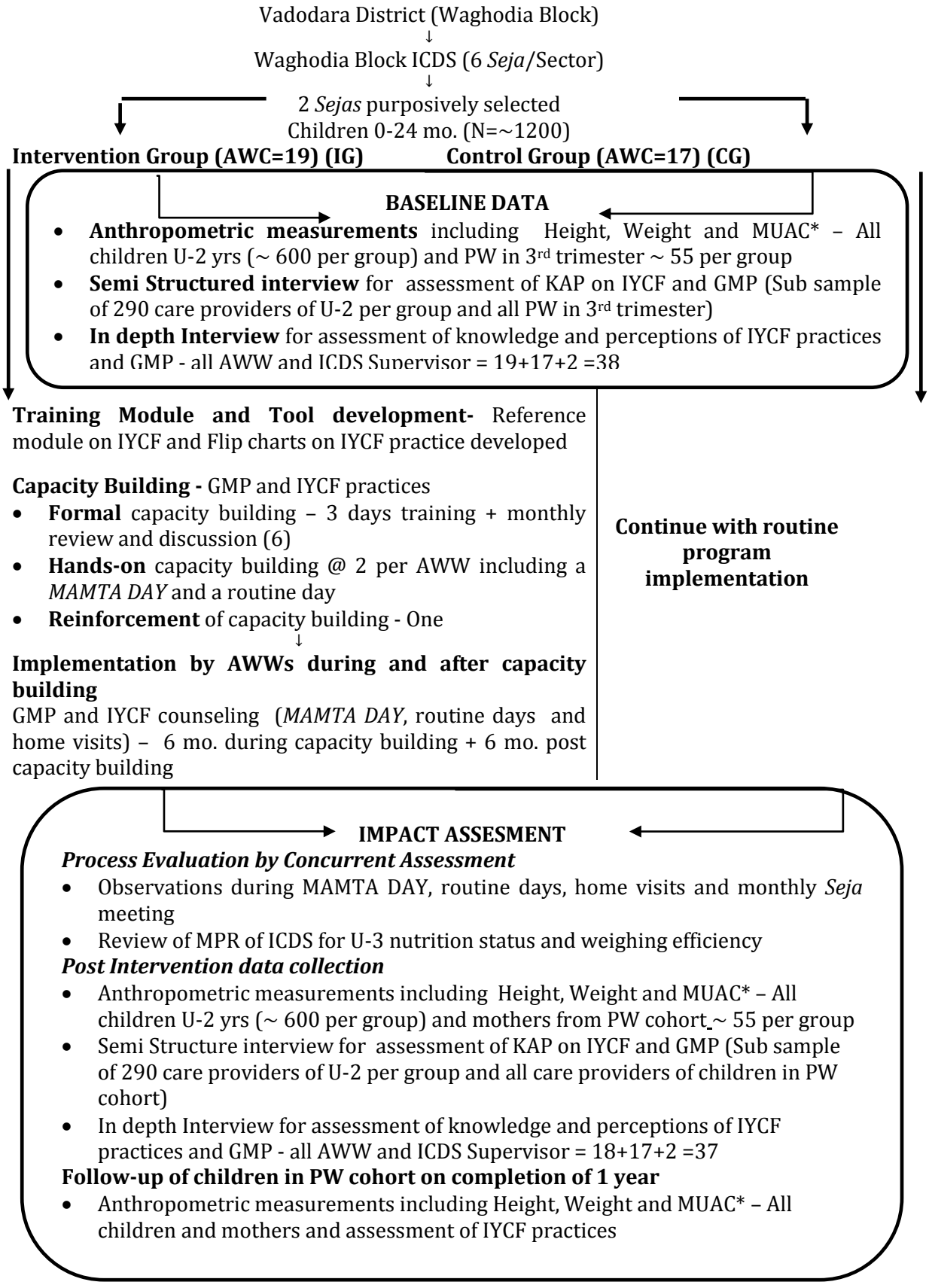
The post data collection was done using the baseline data collection format. Data were collected on anthropometric measurements of children and the IYCF practices and knowledge. The anthropometric measurements of mothers of children born to the pregnant women cohort were also taken.

Follow-up of children in PW cohort on completion of 1 year

The 3rd and final assessment for growth and feeding pattern of children born to the pregnant women cohort was done on completion of one year of age, using the same questionnaire used at baseline (Annexure 1).

The details of the experimental design of the study are presented in Figure 14.

Figure 14: Experimental Design



B. Tools and Methods Used For Data Collection

The Table 7 summarizes the quantitative and qualitative indicators and tools of data collection employed for the study. The tools employed for data collection were pre-tested in a similar rural setting before beginning the actual data collection.

Table 7: Indicators and Tools for Data Collections:

Indicators	Tools
Anthropometric measurements • Weight • Length • MUAC • Height of Pregnant and lactating women cohort	• Infant Weighing Scale and digital weight scale (Picture 6 and Picture 7 :) • Length meter (Picture 8) • MUAC tape (Picture 11) • Height meter (Picture 9)
Socio economic status. Drinking Water, Sanitation and Hand-washing	Pretested standardized semi structured questionnaire (Annexure 1)
IYCF practices , Disease profile and Growth Monitoring and Promotion	
Immunization and Micronutrient Supplementation	
Service Utilization	
Knowledge of Lactating mothers (Under 1 year) and pregnant women on Breastfeeding Practices	
Knowledge of Mother of children under 2 years on complementary feeding practices	
Knowledge and Perceptions of AWWs on IYCF and GMP	Pretested standardized in depth interview question guide (Annexure 2)
Knowledge and Perceptions of Supervisors on IYCF and GMP	
Assess the AWWs' counseling on IYCF and GMP, on *MAMTA DAY*, during home visits and on routine days.	Pretested standardized observation checklist (Annexure 9 and Annexure 10)

1. Qualitative methods

The qualitative methods used in the study included in-depth interviews, semi-structured interviews and non-participatory direct observations.

a) *In-depth Interviews*

***Principle*:** The in-depth interview is a technique designed to elicit a vivid picture of the participant's perspective on the research topic. During in-depth interviews, the

person being interviewed is considered the expert and the interviewer is considered the student (Milena 2007). It is a qualitative research method in which a researcher/interviewer gathers data about an individual's perspectives on a specific topic(s) through a semi-structured exchange with the individual. The researcher's interviewing techniques are motivated by the desire to learn everything the participant can share about the research topic. Researchers engage with participants by posing questions in a neutral manner, listening attentively to participants' responses, and asking follow-up questions and probes based on those responses. They do not lead participants according to any preconceived notions, nor do they encourage participants to provide particular answers by expressing approval or disapproval of what they say. In-depth interviews are usually conducted face-to-face and involve one interviewer and one participant (Mack 2005)

Method: The AWWs and ICDS Supervisors were interviewed in-depth using a question guide. The actual responses of the target groups were noted and for analysis, the responses were grouped into different categories and coded.

The interview schedule for *functionaries* (Annexure 2) included questions related to their knowledge and perceptions of GMP and IYCF practices. The schedule included questions on 7 broad themes:

1) Profile of AWWs
2) Key IYCF practices
3) Breastfeeding
4) Complementary Feeding
5) Growth Monitoring and Promotion
6) Diet during Pregnancy and Lactation
7) Inter Personal Counseling

The questionnaire was prepared by using the standardized formats of the Breastfeeding Promotional Network of India (BPNI) for conducting in-depth interviews for community workers (BPNI). The terms and definitions for IYCF used were as per the National Guidelines on IYCF, 2nd edition (2006), Integrated Management of Neonatal and Childhood Illness (IMNCI) and National Family Health Survey (NFHS) III.

b) *Semi Structured Interview*

***Principle*:** A semi-structured interview is carried out on the basis of a question guide that enlists questions regarding the topic that need to be covered. The researcher's queries follow a pre-determined pattern; however, the focus on the topic may shift

according to the responses of the informant (Bernard 1988). Some questions are structured and some are open ended.

Method: The mothers/care providers of children under two years (0-23 mo.) and pregnant women (enrolled at baseline) were interviewed using a semi structured question guide.

The questionnaire was prepared by using the standardized formats of the Breastfeeding Promotional Network of India (BPNI) for conducting in-depth interviews . The terms and definitions for IYCF used were as per the National Guidelines on IYCF, 2nd edition (2006), IMNCI and NFHS-3.

On completion of anthropometric measurements of the child, the investigator started the interview of all pregnant women in last trimester and randomly sampled mothers of children under two years of age. The interview started with a brief introduction of the interviewer, objective of the study, time required for the interview and an oral consent of the interviewee.

The interview schedule for pregnant women and mothers of children under two years of age (Annexure 1) and the women enrolled in the pregnant women cohort included questions which can be divided into the following 6 categories.

Socio-Economic Status

At first information on the socio-economic background was collected, which included information regarding mothers'/pregnant women's age, caste religion, education, occupation, income (mother and family). This was followed by collection of information on IYCF practices and receipt of counseling.

Receipt of Counseling on IYCF and GMP during Pregnancy and Post Delivery

The ANC, delivery and post natal care details was collected only for the mothers of children below one year of age. The objective was to identify the sources of counseling about early initiation of breastfeeding (EIBF) during pregnancy and EBF, prelacteal feeding and bottle feeding post delivery.

The sources of counseling on the CF practices and GMP were collected from all the mothers of children under two years of age covered in the interview.

IYCF practices of the children (0-23 months)

Along with the information on counseling, the data on IYCF practices of the children under two years was also collected. The data on the IYCF practices collected included information regarding EIBF, prelacteal feeding, feeding problems, EBF, duration of breastfeeding, bottle feeding, initiation of CF, consistency, frequency, quantity and type of CF, hand-washing during feeding, as well as availability,

accessibility, advocacy and utilization of the supplementary food provided by ICDS AWCs.

Knowledge, Attitude and Practices on IYCF and GMP

After the assessment of IYCF practices, the knowledge, attitude and practices (KAP) of mothers on IYCF and GMP was assessed. For assessing the KAP, all mothers of children under two years of age were assessed for GMP and CF, whereas the KAP on EIBF was assessed on pregnant women and EBF was assessed on pregnant women cohort and lactating mothers with children below 1 year.

ICDS Service utilization

The utilization of various services of the integrated child development services (ICDS) scheme for women and children with reference to GMP and IYCF was assessed. The major program covered with this regard were

- *MAMTA DAY* with focus on GMP and counseling on IYCF
- Supplementary Nutrition Program (SNP) with regard to the availability, accessibility, advocacy and utilization of the supplementary food especially *Balbhog* for children 6 to 36 months old provided by ICDS AWCs.

Factors Affection Health and Nutritional Status of Children

During the interview, information was collected on the factors which may have a direct impact on the nutritional status of children below 2 years. This included information on morbidity profile, immunization, micronutrient supplementation, consumption of iodized salt, drinking water sources and storage and hygiene and sanitation. The interviewer observed the site of storage of drinking water and recorded into the questionnaire, similarly salt used in the last cooking was tested using a salt testing kit for iodine estimation.

Undernourished children are sensitive to certain infections and thus morbidity data was collected for correct interpretation of the change in the levels of these parameters. Data on the morbidity profile was collected using a reference period of 15 days during the baseline and post data collections (Annexure 1).

The terms for infectious episodic morbidities were explained if not understood as follows

Diarrhea Defined as passing of more than three loose stools in a day.

Cold Characterized by running nose or blocked nose.

Cough Based on subject's history.

In the morbidity profile, information about kind and sources of treatment, breastfeeding, ORS was also gathered.

c) *Non-participant Direct observations*

Principle*:* Observations are based on examining an object, an individual, a group of people or an event, using all the senses. Carefully observing behavior and events helps to obtain valuable non-verbal cues as to what is actually occurring compared to what is being said (Bernard 1988). Lack of correlation between reported and actual practices may be revealed through direct observations (Kashyap 1990).

Method**:** In the present study direct observations were used to assess the AWWs' counseling on IYCF and GMP in all the AWCs, on *MAMTA DAY*, during home visits and on a regular day. A pre coded observation checklist was used to guide and record the observations (Annexure 9 and Annexure 10).

2. Quantitative methods

The quantitative methods used anthropometric measurement of children under two years and women enrolled in the pregnant women cohort.

a) *Anthropometric Measurements*

Anthropometry is the study and technique of taking body measurements. It is used widely to measure the nutritional status of individuals or populations.

Principle**:** The physical dimensions of the body are markedly influenced by nutrition. Nutritional assessment is concerned with the measurement of the variations of the physical dimensions, at different age levels and degrees of nutrition. Selected body measurements provided valuable information concerning certain types of undernutrition in which body size and gross body composition are affected (Gibson 1989)

In the current study, anthropometric measurements included height, weight and mid-upper arm circumference (MUAC) measurements of all children below 2 years of age. The MUAC measurement was taken for children above 6 months only. Additionally height and weight measurement of women enrolled at baseline in the pregnant women cohort was also taken.

Weight

- **Principle**

Weight is a key anthropometric measurement of body mass. Weight is the single most widely used measurement for the assessment of nutritional status. This is in large part due to the relative ease of measurement and the obvious relationship of

the weight to food intake, absorption and utilizations. Empirical studies have consistently demonstrated the utility of body weight. A low weight measurement can be the result either of a recent acute episode of nutritional inadequacy or chronic malnutrition (Jellifee 1966).

Picture 6: Child Weight Measurement Using an Electronic Weight Scale (UN, 1986)

Picture 7 : Baby Weight Scale for Weighing Young Infants

- **Method**

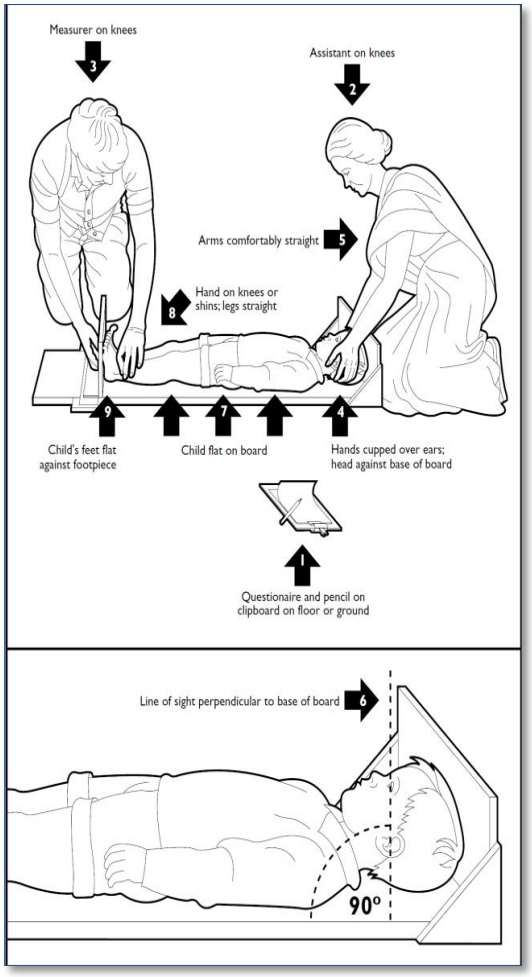
The pregnant women (enrolled at the time of baseline) and children (above one year of age who could stand properly on their own) were weighed barefoot on a UNICEF mother/child electronic scale (Picture 6).

UNICEF Electronic Scale was manufactured by SECA and is a floor scale for weighing children as well as adults (capacity 150 kg). Weighing capacity from 1 kg to 150 kg in 100 g divisions, accuracy +/- 100 g. Weight of adult on scale can be stored (tarred) in memory, allowing the weight of baby or small child held by adult to show on scale indicator. The portable scale, weighing 4 kg, includes a solar cell on-switch (light sensitivity 15 lux) and is powered by a long-life lithium battery good for one million weighing cycles. The major advantage is that it has a microcomputer chip so that it can adjust itself to zero and weighs people quickly and accurately.

While taking the weight measurements, the clothing on the child's body was kept minimal. It was also ensured that the scale was not over-heated in the sun and was placed on an even surface enabling the reading to be clear. The subjects were asked to stand straight on the scale without touching anything and look straight ahead. The scale was checked for accuracy before and after every reading and the weight measurement was recorded to the nearest 0.1kg.

The weight of children less than 1 year was taken using an infant weighing scale (Picture 7). It was ensured that the infant was wearing minimal clothing while taking the weight. The infants were placed on the scale in the manner that they do not touch

any support. The weight was then taken to the nearest 100 gm. Reading was taken twice and the scale was recalibrated to zero before each measurement to ensure accuracy.



Picture 8: Child Length Measurement – For Infants and Children 0–23 months (UN, 1986)

Picture 9: Pregnant Women Height Measurement using Height Meter

Height/Length

- ***Principle***

The height of an individual is made up of the sum of four compartments: legs, pelvis, spine and skull. While, for detailed studies of body proportions, all of these measurement are required in field nutritional anthropometry usually only the total height (or length) is measured (Jellifee 1966). The extent of height deficit in relation to age as compared to regional standards may be regarded as a measure of the duration of malnutrition. A given deficit in height may represent a short period of growth failure at an earlier age or a longer period of growth failure at a later age.

Height measurements of all the pregnant women (3rd trimester) enrolled in the cohort

at baseline were taken using a flexible, non-stretchable height meter (Picture 9). The height meter was kept vertically on a smooth wall of the AWC or house in the community perpendicular to the ground, ensuring that the floor was smooth. The subject was asked to stand erect with the shoulders, hips and heels touching the wall and with no footwear, heels together and looking straight ahead. The head was held comfortably erect, arms hanging loosely by the sides. A thin smooth scale was held on top of the subject's head in the center, crushing the hair at the right angles to the tape and the height of the subject was read from the lower edge of the ruler to the nearest 0.1 cm. The heights were taken twice at baseline and post delivery and the average of both the measurement was taken.

Mid-Upper Arm Circumference (MUAC)

- ***Principle***

Measurements of the mid-upper arm appear to be most useful in practice. This region is easily accessible, even when a young child sitting in front of the examiner on his mother's lap. Also, in kwashiorkor the upper arm is not usually clinically oedematous, while it has been shown that the mid-upper arm is markedly wasted in this condition (Jellifee 1966).

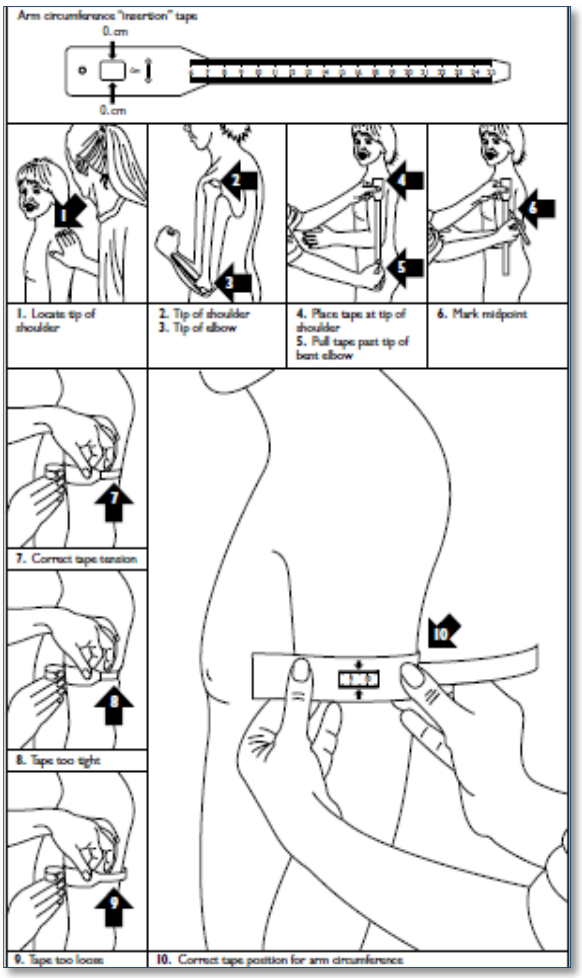
Mid-Upper Arm Circumference (MUAC) is relatively easy to measure and a good predictor of immediate risk of death. It is used for rapid screening of acute malnutrition from the 6-59 months age range (MUAC overestimates rates of malnutrition in the 6-12 months age group).

- ***Procedure***

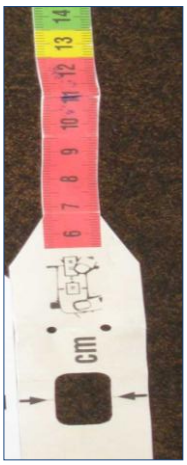
MUAC is the circumference of the left upper arm measured in centimeters. The point is between the tip of the acromial process of the scapula (shoulder) and the olecranon process of the ulna (elbow). Arm circumference is measured with special circumference measuring tapes or circumference insertion tapes. The MUAC tape (Picture 11) used in the current study was a flexible, fiberglass, non-stretchable tape. The steps in measuring mid-upper arm using a MUAC tape are detailed in Picture 10. The child and accompanied care provider were asked to sit down whenever possible. Very young children were held by their mother/care providers during this procedure.

The mother was asked to remove clothing that may cover the child's left arm. For calculating the midpoint of the child's left upper arm, first the tip of the child's shoulder (acromial process of the scapula) with finger tips was located. The child elbow was bent to make a right angle. A tape at zero was placed, on the tip of the shoulder and pulled straight down past the tip of the elbow (olecranon process of the

ulna). The number at the tip of the elbow to the nearest centimeter was noted. The number was divided by two to estimate the midpoint. The midpoint with marked with a pen on the arm. The child's arm was straightened and the tape was wrapped around the arm at midpoint. It was ensured that the numbers were right side up and the tape was flat around the skin. The tension of the tape on the child's arm was examined to ensure that the tape had the proper tension and was not too tight or too loose. The measurements were recorded to the nearest 0.1 cm. The tape was then removed from the child's arm.



Picture 10: Steps in Child Mid-Upper Arm Circumference Measurement (UN, 1986)



Picture 11: MUAC tape use for Mid-Upper Arm Measurement

C. Ethical Aspects and Confidentiality

The study had received ethical approval (F.C.Sc/FND/ME/89 DT 20.9.2011) from the Department of Foods and Nutrition, The M S University of Baroda, ethical review committee.

For each study subject and service provider (AWW and Supervisor), informed oral

consent was taken prior to initiation of data collection. Only those beneficiaries and functionaries willing to participate in the study were included in the sample. Few children found critically ill were advised to take appropriate treatment and excluded from the study.

The AWWs of CG were trained on GMP and IYCF with similar guidelines after completion of data collection.

D. Statistical Analysis

- The Z-scores of anthropometric data was calculated using the new international reference population released by the WHO (Onis 2006) and accepted by the Government of India.
- The risk ratio and risk difference estimate of all anthropometric parameters post capacity building, were calculated within the intervention and control group.
- The anthropometric measurements and data from in-depth interview of children under two years were entered into Epi Info 6.04d. The data entered was analyzed using the SPSS version 10, Microsoft Excel 2007 and Epi Info 6.04d.
- Frequency and percentages were calculated for all parameters that were expressed in categories.
- Mean and standard deviation were calculated for all parameters that were expressed numerically.
- Chi-square test was used to assess the difference between the frequency distributions.
- Corrected chi-square was used, to asses' pre and post difference within the group since, the study population was not static.
- Independent 't' test and paired't' test was used to compare differences between the means.
- Correlation coefficients were computed between indicators of nutritional status and IYCF practices and other parameters of interest.
- Stepwise multiple regression analysis was done to identify independent variables that had a significant role in influencing the four dependent variables (weight-for-age, height-for-age, weight-for-height and MUACZ)
- The in-depth interview schedule of AWWs and Supervisors was entered into excel sheet. One vertical column represented one interviewee. The entire interview was divided into 7 themes and 24 indicators. Each question within a theme was graded based on the correctness of the response.
    - The responses were quantified into number and percent score wherever

possible and presented in tabular form. For this the entire interview was scored, 1 point (score) per AWW for each preferred response e.g. in the question 2 (Annexure 2) *what do you mean by optimum infant and young child feeding? List four key IYCF practices?* The question was rated on total 4 marks, since there were 4 important aspects to be covered.

- Further, mean scores were calculated for all indicators taking mean of all responses of all AWWs. Negative marking was done only in CF section while assessing knowledge and perceptions about type and consistency of food. These were only when AWWs listed thin liquid foods as CF.
- Independent t-test was applied for pre and post mean scores between IG and CG, whereas paired t-test was applied within IG and CG mean score, pre and post capacity building.
- At the time of post data collection one AWW of IG had resigned. Hence the post data tabulation was done considering 18 AWWs, pre and post for IG.

CHAPTER 5: RESULTS AND DISCUSSIONS

This chapter presents the major findings of the study, in accordance with the major objectives of the study. The overall objective of the study was; to build the capacity of *Anganwadi* workers of ICDS scheme on growth monitoring and promotion, and infant and young child feeding, and to assess its impact on infant and young child feeding practices and nutritional status of children under 2 years of age.

The study findings are presented and discussed under the following sections;

I. Baseline Assessment

A. Knowledge and perceptions of the *Anganwadi* workers and the Supervisors

B. Undernutrition prevalence, and associated infant and young child practices of the care providers of the children under two years of age

II. Process Evaluation

A. Process evaluation of the capacity building by concurrent assessment

III. Impact Assessment

A. Impact of capacity building of *Anganwadi* workers on the knowledge, perceptions and practices of the *Anganwadi* workers and the Supervisors

B. Impact of capacity building on undernutrition prevalence, and associated infant and young child practices of the care providers of the children under two years of age

I. Baseline Assessment

A. Knowledge and Perceptions of the *Anganwadi* Workers and the Supervisors

This section addresses the following specific objective of the study;

- ✓ **To assess the knowledge and perceptions of *Anganwadi* workers with regard to growth monitoring and promotion and infant and young child feeding practices, among selected rural *Anganwadi* centers' of Vadodara district.**

This section presents the knowledge and perceptions of *Anganwadi* workers (AWWs) and ICDS Supervisors covered under the study. The knowledge and perceptions were assessed in four major areas i.e., Infant and Young Child Feeding Practices (IYCF), Growth Monitoring and Promotion (GMP), Diet during pregnancy and

lactation and Inter Personal Counselling (IPC) skills. Only the key responses have been discussed in the following sections.

1. Profile of *Anganwadi* Workers and Supervisors

A total of 36 AWWs (19 IG + 17 CG) and two ICDS Supervisors were interviewed at baseline. The AWWs covered had varied profile (Table I-1). Majority of AWWs (16) were educated till 10th Grade and majority (21) had ICDS work experience in between 10 to 19 years. All the AWWs had received ICDS job training and at least one ICDS refresher training (except 1). Further, 28 AWWs had received training in Integrated Management of Neonatal and Childhood Illness (IMNCI) which also covers the IYCF and IPC component.

Also as presented in Table I-1, the profile of both the ICDS Supervisors was almost similar in terms of experience, age and trainings received. Both Supervisors were also trained in IMNCI, as well as, IYCF training conducted by the State, while only, 1 of the 2 ICDS Supervisors had received IMNCI supervision training.

Table I-1: Profile of AWWs and Supervisors

Indicators	AWWs (N=36)	Supervisors (N=2)
Education (grade)	10* (7,12)	-
Age (yr)	39*(24,53)	49
Experience (yr)	12* (1,27)	24
ICDS job training	36#	Yes
Refresher training	45# (0,3)	2-3
IMNCI training	28#	Yes

** Average (Min, Max) # Total*

2. Key IYCF Practices

While the AWWs and Supervisors were able to mention one or more key IYCF practices, the workers who knew and mentioned all 3 key practices was dismally low 8% (Table I-2). Many workers mentioned starting complementary food (CF) with water, and most of them missed out the practice of continuing breastfeeding till 2 years and beyond along with complementary feeding. Similarly, both the Supervisor's also stated the third IYCF practice partially as one of the Supervisor specified "to start with liquid food from 7th month" and the second Supervisor specified "continued breastfeeding till 2 years" failing to mention "and beyond".

Table I-2: Knowledge of AWWs Regarding Key IYCF Practices

Key IYCF Practices	AWWs % (N=36)
1) Initiation of breastfeeding immediately after birth, preferably within one hour.(* includes half hour responses)	49 (18)
2) Exclusive breastfeeding for the first 6 mo. i.e., the infants receives only breast milk and nothing else, no other milk. Food, drink or water.	78 (28)
3a) Appropriate and adequate complementary feeding from 6 mo.	86 (31)
All 3 correct	**25 (9)**
3b) Continued breastfeeding upto the age of 2 yr and beyond.	31 (11)
All 4 correct	**8 (3)**

***Note**: Key responses of the AWWs included*

3. Breastfeeding

a) *Benefits of Breastfeeding*

All AWWs agreed that breastfeeding is important for infants. The AWWs listed on average 3 to 4 benefits of breastfeeding. The key benefits listed by most AWWs were, *'Breastfeeding protects against infection-"Rog na thaya"'; 'Breastfeeding delays pregnancy'* (Table I-3). Some of the benefits not listed by AWWs were breastfeeding prevents hypothermia in baby and breast milk is easily digestible.

The Supervisors could only list around 50% (11/23) benefits of breastfeeding. Further, it was noted that none of the Supervisors listed some important benefits such as breastfeeding helps in reducing the weight gained during pregnancy, enhance IQ and immunity of baby etc.

Table I-3: Knowledge of AWWs Related to Benefits of Breastfeeding

Benefits of Breastfeeding	AWWs % (N=36)
– Protects against infection; enhances immunity; keeps baby healthy; baby does not fall sick	81 (29)
– Delays next pregnancy	50 (18)
– Complete food/all nutrition	25 (9)
– Helps bonding between mother and child	25 (9)
– Protects against breast cancer, ovarian cancer and uterus cancer	25 (9)
– Ready to serve, fresh, hygienic, right temperature	22 (8)
– Helps in adequate growth and development	22 (8)
– Prevent obesity, helps in regaining figure	19 (7)
– Prevents breast engorgement and abscess	14 (5)
– Low cost involved	8 (3)

Benefits of Breastfeeding	AWWs % (N=36)
– Less illnesses, contributes to child survival	8 (3)
– Helps mother to remain healthy	6 (2)
Single response	
– Ensures better IQ for child ; Reduces post delivery bleeding and anemia (helps in involution of uterus); Promotes Family planning; Protects against adult onset diseases (heart disease/ diabetes/ lymphoma)	

***Note**: Key responses of the AWWS included. Multiple responses, total may not add upto 100%*

b) *Early Initiation of Breastfeeding*

Total 86% (31) AWWs mentioned correct time for initiating breastfeeding, i.e. within one hour of birth. It was surprising to note, that 3 AWWs recommended initiating breastfeeding within 24 hours; this response may be related to the actual situation observed by AWWs in field. Both the Supervisors were aware of Early Initiation of Breastfeeding (EIBF). However, none of the Supervisor knew adequately the reason behind EIBF.

Most of the AWWs reported colostrum feeding and enhanced immunity, as key reason for EIBF. Even though the AWWs and their Supervisors were trained on EIBF, and its impact on mother and child survival, in various trainings such as IMNCI, IYCF and ICDS training, none of them related EIBF to enhancing mother and child survival (prevention of mother's blood loss and prevention of hypothermia in baby), benefits, which may be useful in convincing the community to ensure EIBF.

Initiation of Breastfeeding after Caesarean Section

Only one AWW stated that breastfeeding can be initiated after 4 hours of cesarean section (Tabel I-4); 47% (17) AWWs recommended immediately within 4 hours. Less than 50% AWWs had some information about how to initiate breastfeeding after caesarean section. Around 22% (8) AWWs recommended expressing breast milk which may not be required in case of cesarean section.

Even though both the Supervisors did mention that breastfeeding can be initiated as soon as mother is out of the effect of anesthesia, none of the supervisors exactly stated that, breastfeeding can be initiated after 4 hours in case of caesarean section.

Table I-4: Knowledge of AWWs Related to Early Initiation of Breastfeeding

Knowledge on Early Initiation of Breastfeeding	AWWs % (N=36)
Early Initiation of Breastfeeding (EIBF)	
– Immediately; Within half hour ;Within one hour	86 (31)
Benefits of EIBF	
– Gets colostrum; infants first vaccine; protects from infection/enhances immunity	75 (27)
– Baby remains healthy; falls sick less often; enhances immunity; protects and prevents from all disease and infections	44 (16)
– Stimulates breast milk production ; establishes breastfeeding	8 (3)
– Has vitamin A, benefits and protects eyes	8 (3)
– Fosters bonding between mother and newborn	8 (3)
Early Initiation of Breastfeeding after Caesarean Section	
– After 4 hours of operation	3 (1)
– When mother is out of the effect of anesthesia.	28 (10)
How to Initiate Breastfeeding after Caesarean Section	
– All mothers with caesarian section can successfully breastfeed the babies with assistance for the first few days	44 (16)
– Baby can be tilted to one side in the lying down position and fed	14 (5)
– Put child on mothers chest and breastfeed	11 (4)

***Note**: Key responses of the AWWS included*

Colostrum Feeding

The AWWs and Supervisors listed only 4/7 benefits of colostrum feeding, majority of them (72%, 26) stated that colostrum protects from diseases and enhances immunity (39%, 14). None of the AWWs mentioned other benefits of colostrum feeding like colostrum protects from allergy; has a laxative effect; is good for intestine; clears initial black stool faster and protects from hepatitis; colostrum has a growth promotional factor and is the first vaccine. The other two benefits listed were; colostrum is rich in Vitamin-A/prevents night blindness (28%, 10) and colostrum is full of WBC (8%, 3).

The Supervisors also missed out some key benefits such as colostrum is good for intestine, clears initial black stool faster and protects from hepatitis and protects from allergy (Table I-5).

Table I-5 : Knowledge of Supervisors Regarding Benefits of Colostrum Feeding

Benefits of Colostrum	Responses
Full of WBC; Protects from infection / disease; Enhances immunity/ First vaccine	Colostrum gives immunity
Laxative effect	Improves child digestion power, laxative effect
Growth promotional factors	"Sarira ane hataka majbut thaya che - Makes body and bones strong"
Vitamin A rich	Rich in Vitamin A

Prelacteal feeding

Over two-thirds (78% 28) of the AWWs stated that prelacteal feeds lead to infection with 31% (11) stating that it is unhygienic. Also, the Supervisor's knowledge with regard to the adverse effects of prelacteal was satisfactory. However none of the AWWs or Supervisors acknowledged that some prelacteal feeds contains medication which may be harmful.

c) *Exclusive Breastfeeding till 6 months – Definition and Benefits*

Except for one, all AWWs (97%, 35) knew the exact duration of Exclusive Breastfeeding (EBF), i.e. first 6 months. While defining EBF majority of them (around 65%) missed out the key message i.e. no food, fluid, prelacteal feed. Most of them stated only breast milk (97%, 35) and not even water (83%, 30). The Supervisors also missed out some key messages like give no food except prescribed medicine.

With reference to benefits for EBF, the AWWs could articulate a few key benefits like breast milk provides all nutrients (47%) and prevents morbidity and infection (31%) (Table I-6). Overall, the responses of AWWs and one of the Supervisors was very poor and may not convince many families for continuing EBF.

Table I-6: Knowledge of AWWs Regarding Exclusive Breastfeeding

Exclusive Breastfeeding	AWWs % (N=36)
Benefits	
– Breast milk provides all nutrients /vitamins	47 (17)
– Less morbidity/infection / diarrhea/vomiting	31 (11)
– Child can only digest milk, not anything else	17 (6)
– Breast milk provides everything in correct amount/ is adequate for baby	14 (5)
– Satisfies hunger of infant upto 6 mo.	6 (2)
– Child doesnot require water even during hot seasons	6 (2)
– Ensures appropriate weight gain/ prevents weight loss	3 (1)

***Note**: Key responses included. Multiple responses, sum may not add upto 100%*

Some key messages missed by most of the AWWs and Supervisors were EBF baby doesn't require water even during hot seasons, EBF ensures appropriate weight gain/ prevents weight loss and EBF satisfies hunger in infants upto 6 months of age. These reasons/messages could be critical to convince and inspire community to ensure EBF. One AWW added to the definition *"If mother is not able to breastfeed then give cow or goat milk with cup and spoon".* This clearly reflects the poor articulation of messages by AWWs while counselling on IYCF.

d) *Frequency, Duration and Adequacy of Breastfeeding*

Infants and young children may not be able to express hunger in words, hence care givers need to recognize early signs of hunger, and feed the baby before it starts crying.

Mothers should feed babies at a specific interval of 2-3 hours or earlier if demanded so that babies can take adequate feed peacefully. Only 14% (5) gave the complete response, whereas, most of the AWWs (36%) gave a partial response, either mentioning -to breastfeed by time interval (17%, 6) or to breastfeed on demand (19%, 7). Regarding breastfeeding frequency, only 61% (22) AWWs mentioned correct frequency i.e., "8-12 times in 24 hours". While explaining the frequency of breastfeeding, the AWWs should always emphasise "***minimum"*** 8-12 times in 24 hours, which was only specified by 8% (3) AWWs. With reference to duration of breastfeeding, only 28% (10) recommended the correct duration.

Also, none of the Supervisors presented complete knowledge regarding the breastfeeding frequency, duration and adequacy. Such poor knowledge of AWWs and Supervisors can have an adverse impact on the prevalence of EBF and undernutrition.

Not Enough Breast Milk

The knowledge of AWWs and Supervisors was absolutely poor regarding, breast milk adequacy and practical application of this knowledge on the real life situation; whenever mother's come with complain of *"Not Enough Breast Milk".*

Although the AWWs and Supervisors were trained in IMNCI, none of the AWWs and Supervisors recommended checking urination at first instance, whereas only 19% (7) AWWs and none of the Supervisors recommended checking weight gain to verify mothers complaint of *"Not Enough Breast Milk".*

Most of the AWWs (94%, 34) gave general advice like *"For increasing breast milk, mother's need to increase diet and take iron tablets regularly".* A

quarter of AWWs (25%, 9) recommended giving top feed with cup and spoon/ on doctor's advice and 22% (8) recommended mothers to take more water.

e) *Methods of Breastfeeding*

For a mother to successfully EBF the child, she also needs to follow correct positioning; attachment and suckling *while* breastfeeding, as well as, a mother requires guidance on feeding during normal and special situations. *This knowledge is very crucial for ensuring that a mother, who is willing to EBF, succeeds in EBF her child.* As described in Table I-7, the knowledge and perceptions of AWWs was assessed in this regard.

The AWWs could list on an average 4-5 of the 11 signs for assessing correct attachment, positioning and suckling, whereas the Supervisors listed 10/11 signs, although this was part of the IMNCI training.

Table I-7 : Knowledge of AWWs Regarding Methods of Breastfeeding

Indicators	AWWs % (N=36)
Attachment	
• Baby's mouth is wide open	69 (25)
• Lower lip is curled outward	36 (13)
• Chin touches the breast /Nose not touching breast	53 (19)
• Areola in the mouth	75 (27)
Positioning	
– Head and body are straight and not twisted or bent	36 (13)
– Baby faces the breast – nose opposite the mother's nipple	11 (4)
– Baby is close to the mother	25 (9)
– Baby's whole body is supported and not just head/shoulder	14 (5)
Suckling	
– Sucks slowly	33 (12)
– Sucks deeply/long	58 (21)
– Sometimes after holding for few minutes	14 (5)

Assessing the knowledge and perceptions of AWWs about methods of breastfeeding it was noted that only 33% were aware that breastfeeding at night increases breast milk production, although the knowledge of AWWs was adequate with regard to feeding from both breasts, only 39% AWWs gave complete answer (Table I-8).

Table I-8 : Knowledge of AWWs Regarding Methods of Breastfeeding

Methods of Breastfeeding	AWWs % (N=36)
Importance of breastfeeding during night - "Yes"	97 (35)
Breastfeeding at night increases milk production – "Yes"	33 (12)
Mother can breastfeed in Side-lying position – "Yes"	39 (14)
Mother should use both breasts during each breastfeed - "Yes"	
– One breast must be emptied out fully before the second is offered; When the baby releases one breast, other should be offered	39 (14)
– Let the baby decide. Take hint from baby. Baby may prefer to have milk from one or both breasts at each feed	3 (1)
– If the baby is still hungry, baby will feed from the other breast	3 (1)
Important to breastfeed from different breast on each breastfeed - "Yes"	91(30/33)

Even though both the Supervisors' were aware of breastfeeding at night, use of both breasts during each breastfeed, and breastfeeding from alternate breast during every new breastfeed, only one Supervisor was aware that breastfeeding at night increases breast milk production, as well as, gave complete answer that "One breast must be emptied full before the second is offered".

Lastly, only one Supervisor stated that, mothers' can breastfeed in side-lying position. Another Supervisor had a concern that "Nose should not be pressed" although the concern of Supervisor was valid, but the Supervisor was not aware, that it was alright for the mother to breastfeed in side-lying position especially at night or in conditions when she can't sit and feed

Bottle feeding

Answering the hypothetical question *"Is there any harm in using bottle when boiled carefully and used"* only 61% (22) AWWs recommended not to bottle feed the baby. Maximum AWWs (58%, 21) stated that bottle feeding leads to infection and 6% (2) of them stated the other two reasons i.e. baby starts refusing the breast due to nipple confusion and bottle-feeding would reduce mothers own milk supply. This knowledge is essential for AWWs to convince caregivers not to follow the harmful practice of bottle feeding.

The knowledge of both the Supervisions regarding bottle feeding was also inadequate.

Supervisor's Responses
"Plastic is harmful; "*Salah apvani nathi, bottle na dudh ni salah apvani nathi*" –we can't advise on giving bottle feeding and bottle milk"
"Bottle has bacteria which affects child's digestion and causes diarrhea, child doesn't forget bottle soon"

Breastfeeding during Pregnancy or Illness

One of the major problems faced by mothers, in continuation of breastfeeding till 2 years and beyond, is immediate pregnancy within one to one and half year of child's birth. The knowledge and perceptions of AWWs and Supervisors, on breastfeeding a child during mother's pregnancy, was absolutely based on field learning and not following the guidelines or recommendations in this regard (Table I-9). Most of the AWWs believed "If mother breastfeeds during pregnancy, baby would become weak". Whereas, one of the Supervisor mentioned *"Can stop after 6 months….give breast milk for initial months, then should stop later on since both baby cannot be nourished well"*

Initially 94% (34) AWWs and Supervisors agreed that breastfeeding should be continued during sickness, however questioning further, the AWWs, agreeing to the need for continued breastfeeding during some major sickness such as TB, Hepatitis B etc were comparatively lesser (Table I-9). Similarly, during some major sickness, none of the Supervisors mentioned about vaccinating the baby, in case the mother has TB, Hepatitis B or giving medicine to baby in case of TB. This shows the limited and very superficial knowledge of Supervisors, on breastfeeding during major illness of mother.

Regarding AWWs and Supervisors knowledge about breastfeeding by HIV positive mother, none of the AWWs mentioned, about explaining options and allowing mother to choose between breast milk and top milk using AFASS (Acceptable, Feasible, Affordable, Safe and Sustainable) criteria, as well as, advising mother not to give mixed feeding.

Table I-9: Knowledge of AWWs Regarding Breastfeeding during Pregnancy or Illness

Responses of Mothers	AWWs % (N=36)
Breastfeeding child under 6 mo. during mother's pregnancy- "Yes"	42 (15)
Breastfeeding child above 6 mo. during mother's pregnancy - "Yes"	14 (5)
Mother suffering from TB	
Breastfeed - "Yes"	44 (16)

Responses of Mothers	AWWs % (N=36)
Breastfeed - Yes with required medicine and/or vaccination for baby	11 (4)
Mother suffering from Hepatitis B	
Breastfeed - "Yes"	37 (13/35)
Breastfeed - Yes with required medicine and/or vaccination for baby	9 (3/35)
Mother suffering from Malaria - "Yes"	69 (25)
Mother suffering from Typhoid - "Yes"	61 (22)
Breastfeeding to be continue if mother is HIV Positive	
– Exclusive breastfeeding	17 (6)
– Replacement feeding, animal feed; No breastfeed ; give top milk	42 (15)
– As per doctor's and/or nurse's advice	25 (9)

Breastfeeding during Breast Problems

Some common problems faced by nursing mothers are cracked nipples, breast engorgement and breast abscess. In absence of proper guidance, mothers' difficulty with such problems may worsen and end up with discontinuation of breastfeeding. As presented in Table I-10, the knowledge of AWWs and Supervisors with regard to breastfeeding during breast problem was very poor.

Table I-10: Knowledge of AWWs Regarding Breastfeeding during Breast Problems and Suggested Treatment

Breast Problems and Suggested Treatment	AWWs % (N=36)
Cracked nipple	
– Breastfeed the child / continue breastfeeding	42 (15)
Suggested treatment	
– Apply hind milk on the nipple	19 (7)
– If pain is unbearable then express milk with hand	19 (7)
– Go to hospital/consult doctor	50 (18)
Breast Engorgement	
– Continue breastfeeding	39 (14)
– Breastfeed from another breast	6 (2)
– Feed from both sides	8 (3)
Suggested treatment	
– Ask mother to express milk so that breast becomes less engorged and then start breastfeeding baby directly	17 (6)
– Give hot water compress on breast	33 (12)
– Go to hospital/consult doctor	61 (22)
Breast abscess	
– Continue breastfeeding	19 (7)
Suggested treatment	
– Needs to be removed surgically	8 (3)

Breast Problems and Suggested Treatment	AWWs % (N=36)
– Mother can breastfeed from another breast which is free from abscess	14 (5)
– Go to hospital/consult doctor	78 (28)

4. Complementary Feeding

Knowledge and perceptions of AWWs was assessed based on the WHO ten guiding principles for Complementary Feeding (CF).

a) *Initiation of Complementary Feeding and Continuation of Breastfeeding*

Initiation of CF on completion of six months is vital for prevention of undernutrition. Almost all (97%, 35) AWWs mentioned correct age for initiation of CF. Continuing breastfeeding till 2 years and beyond along with CF is equally important, only 14% AWWs had the appropriate knowledge regarding this, most of the AWWs (47%) were partially aware that "breastfeeding needs to be continued till 2 years" failing to mention "and beyond", which again would be a very crucial and important message, for community, to follow optimal IYCF practices. Also, none of the AWWs knew the complete reason behind the recommendation for continuation of breastfeeding till 2 years and beyond, which further presented very poor capacity of AWWs to convince community about the importance of continuing breastfeeding till 2 years and beyond (Table I-11).

In midst of this one AWW did mention; *"Mother's milk is not adequate to fill child's stomach; child undergoes physical and mental change, so need CF to maintaining nutrition status"; "Child may eat may not eat, continuation of breastfeeding will ensure that stomach gets full and ensures regular growth and milestone"*

Even though, the Supervisors were aware of continuation of breastfeeding till 2 years and beyond; none of them knew complete reasons behind this recommended practice.

Table I-11: Knowledge of AWWs Regarding Age of Initiation of Complementary Feeding and Continuation of Breastfeeding

Responses of AWWs	AWWs % (N=36)
Reason for initiation of CF from six months onwards	
– After six months of age mother milk only is not sufficient to meet the growing infant needs	81 (29)
– Appropriate age of initiation of Family foods - Around 1 year	28 (10)
Duration of Continuation of Breastfeeding along with CF	
✓ Two years and beyond	14 (5)
✓ Upto 2 years	47 (17)

Responses of AWWs	AWWs % (N=36)
Reasons	
– Provides vital source of energy and nutrients into 2nd year of life	6 (2)
o Gets energy/vitamins/nutrients from breast milk	3 (1)
o Child can't eat everything so child gets all missing nutrients from mother's milk/child may not like all the kind of CF which is being offered to him	11 (4)
– Provides fluids and nutrients *during infection*	3 (1)
o child gets healthy / does not feel sick	8 (3)
– Associated with greater linear growth	-

***Note**: Only essential perceptions are presented in the table. The responses may add upto more than 100% due to multiple responses.*

b) *Type of Complementary Foods*

The AWWs and Supervisors listed around 9-10 out of 14 food groups listed in the complementary foods list (Table I-12). A majority of AWWs recommended cereals (61%), pulses (67%), fruits (64%), and milk (44%) as CF. Food available at *Anganwadi* Centre (AWC) was also mentioned by 25% AWWs and one of the ICDS Supervisor. Even though 44% AWWs recommended foods with thick consistency, 67% AWWs also recommended thin liquid diets for children.The low energy and protein density in CF normally observed could be attributed to these perceptions.

Table I-12: Knowledge of AWWs Regarding Type of Complementary Foods Recommended For Children 6-23 months.

List of Complementary Food Items and Reason	AWWs % (N=36)	Supervisors (N=2)
Food Groups		
– Cereals (Rice, Wheat, Maize, Millets)	61 (22)	√
– Pulses and Legumes like mug	67 (24)	√
– Fruits like Banana, Chikoo, Mango	64 (23)	Seasonal Fruits
– Milk	44 (16)	√
– Roots and tubers e.g. potato (mashed)	31 (11)	Boiled potato
– Fats and Oils	19 (7)	√
– Vegetables	17 (6)	Vegetables …. mashed
o Green leafy vegetable	14 (5)	GLVs
– Sugars, Jaggery Honey	11 (4)	Jaggery
– Nuts and oil seeds	6 (2)	-
– Yellow and Orange Fruits and Vegetables, tomatoes	6 (2)	-
Type of food		
– Any liquid food	67 (24)	-
– Homemade food	22 (8)	-

List of Complementary Food Items and Reason	AWWs % (N=36)	Supervisors (N=2)
– *Balbhog* / AWC snacks	25 (9)	-
– Rab, sheera, dense liquids, kheer; Medium / Dhili Rab ; Khichadi / rice, *Masdelo* (mashed) bhaat; *Jadi(thick)* dal	44 (16)	-

Eight food items not appropriate for children 6-11 months old were listed and the AWWs were questioned, whether they would recommend these or not. This was to assess AWWs perceptions regarding such items. Of all eight items, carbonated beverages, biscuits and fruit juice were not recommended by 94%, 14% and 8% AWWs (Table I-13) respectively. On an average most of the AWWs (72%, 26) gave 5-6 correct responses.

Table I-13: Knowledge of AWWs Regarding Foods to be avoided by Children 6-11 months (Not appropriate)

Food Items	AWWs % (N=36)
– Carbonated drinks	94 (34)
– Tea or Coffee	89 (32)
– Foods with seeds	89 (32)
– Spicy foods	86 (31)
– Other juices e.g. Rasana	78 (28)
– Ready-to-eat fast foods: Wafers, Pizza	75 (27)
– Biscuit	14 (4/29)
– Fruit juices	8 (3)

***Note**: Only essential perceptions are presented in the table. Multiple response, responses may add upto more than 100%.*

c) *Frequency, Quantity and Consistency of Complementary Foods*

Triangulating the above knowledge of AWWs about type of CF recommended (Table I-14) with the perceptions of AWWs on CF consistency (Table I-14) the scenario was totally opposite, with 78% AWWs recommending mashed and/or thick dense foods for children 6-12 months and only 14% AWWs recommending thin/ liquid/fruit juice for children. Thus there was a gap between the AWWs knowledge and perceptions about optimal CF practices.

Table I-14: Knowledge of AWWs Regarding Appropriate Frequency, Quantity and Consistency of Complementary Foods

Responses of AWWs	AWWs % (N=36)
Children 6-12 months	
Appropriate Frequency	
– Three times	47 (17)
– If not breast feed than five times	50 (18)
Appropriate Quantity	
– One bowl (250 ml) each time	36 (13)
Appropriate Consistency	
– Mashed /or thick / dense	78 (28)
– Finger food by 8 mo.	3 (1)
Children 1-2 years	
Appropriate Frequency	
– Five times	64 (23)
Appropriate Quantity	
– One and half bowl each time	19 (7)
– Half of adults	8 (3)
Appropriate Consistency	
– Family food	83(30)
Children 6-23 months	
Appropriate Quality of Complementary food	
– Soft	69 (25)
– Hygienic/boiled	42 (15)
– Nutritious / calorie dense	28 (10)
– Right consistency	19 (7)
– Easy to digest	14 (5)
– Fresh and hot	14 (5)
– Inexpensive / locally available / culturally acceptable / easily prepared at home	-
Incorrect Response - Thin/Liquid/fruit juice	14 (5)

The AWWs and Supervisors knowledge with reference to the CF frequency and consistency was not adequate due to two major gaps in perceptions (Table I-14). Firstly, most of them recommended introducing liquid diet at 6 months in place of dense food (AWWs 9/36, 25%) and, secondly AWWs recommended lesser quantity of food for children 1-2 years (AWWs 22/36, 61%).

d) ***Feeding Children during and after Illness***

The WHO guiding principles for CF recommends, increased fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft,

favorite foods. Only 22% (8) AWWs suggested giving small frequent feeds and 6% (2) advised on continuing breastfeeding, during illness. Further only 22% (8) AWWs advised giving an extra meal, after illness, which was as per the guiding principle of CF.

None of the Supervisors mentioned giving small and frequent feeds which could be very crucial for prevention of malnutrition. The Supervisors did mention giving, easily digestible food like '*khichadi'*, lime juice, coffee and encouraging the child to drink and to eat with lots of patience. With reference to feeding after illness, only one of the Supervisor recommended to increase the quantity of meal after illness, whereas, another Supervisor only mentioned giving protein and calorie rich food.

e) *Methods to Promote/Encourage Complementary Feeding*

The knowledge of AWWs and Supervisors, regarding techniques for encouraging child to eat, showed very limited approach, knowledge and involvement of AWWs in promoting CF.

Showing affection, love, bribing child with ice cream, chocolates and toys, feeding in company of other or older kids, comparing and relating with other kids were the most common methods (83%) recommended by most of the AWWs to encourage child to eat.

On assessing the knowledge of AWWs about ways to encourage child for complete the served portion, none of the AWWs and Supervisors demonstrated persistence in feeding the child with required quantity of food. None of them advised on experimenting with taste, consistency and food items, for ensuring that the child consumes required quantity of food. Most AWWs only suggested that a child needs to be encouraged to eat (39%) e.g. with play, songs and story, comparing with other child who are eating, feeding child in company of other kids.

Further, the AWWs and Supervisors were asked to grade various feeding behavior as appropriate and inappropriate. None of the AWWs could grade all 6 behaviors correctly. Most of the AWWs could grade 2-3 behaviors correctly (Table I-15) whereas; the Supervisors' graded all 6 behaviors correctly. Thus, very limited approach, knowledge and involvement of AWWs in promoting CF was evident.

Table I-15: Knowledge of AWWs Regarding Complementary Feeding Behaviors

Responses of AWWs	AWWs % (N=36)
Appropriate	
Milk in cup rather than bottle to 2 yr old	89 (32)
Talking to a 10 mo.-old child during meal	72 (26)
Showing affection to a 15 mo. old child while feeding, showing that he/she is loved by every one	75 (27)
Inappropriate	
Giving a 10 mo. child own bowl and spoon to eat alone	67 (24)
Keeping a 12 mo. child from touching her food and plate	75 (27)
Spoon feeding and holding a cup for a 24 mo. old, not allowing child to touch spoon	94 (34)

5. Care during feeding

Total 11 care practices were identified which the caregivers could ensure while feeding the child (Table I-16). When assessed, the AWWs on an average listed 2 practices, whereas the Supervisors' listed 3-4 care practices.

Table I-16: Knowledge of AWWs Related to Care during Feeding

Responses of AWWs	AWWs % (N=36)	Supervisors (N=2)
– Ensures cleanliness of dishes and utensils; the child's face, fingers; clean after eating; free from flies	78 (28)	*Give hygienic food, ensure cleanliness of dishes, utensils and child hands*
– Notices progress and how much is eaten	50 (18)	√
– Assists in self-feeding /completing food*	17 (6)	-
– Provides a sociable setting, good environment	17 (6)	-
– Should not be throwing food on floor/eating from floor	19 (7)	-
– Expresses affection / Encourage and feed	8 (3)	-
– Gives child time to eat at his/her pace / child should chew well	8 (3)	*Feed slowly and patiently; give time to child*
– Provides physical support/contact	6 (2)	-
– Checks temperature and size of bites.	3 (1)	*Fresh food*
– Recognizes signs of hunger and wanting food	3 (1)	-
– Child has own bowl and utensil	3 (1)	-

a) *Indicators that Child is Hungry*

Majority of AWWs (97%) and both Supervisors' listed crying as an indicator of

hunger, which showed that the awareness on early sign of hunger was not very good, since crying is one of the late signs of hunger (Table I-17).

Table I-17: Knowledge of AWWs Regarding Indicators that Child Is Hungry

Responses of AWWs	AWWs % (N=36)	Supervisors (N=2)
– Cries	97 (35)	√
– Child sucks fingers	11 (4)	√
– Mouthing	11 (4)	-
– Gets irritable / not happy / Observing the child	3 (1)	-
– Time intervals between two meals	-	√

b) *Reasons for Poor Appetite in Children*

The AWWs listed sickness (47%, 17), whereas the Supervisors listed prolonged breastfeeding without CF, sickness, fever and child more interested in play, as the key reasons for poor appetite. Micronutrient deficiency, fever and mouth lesions were listed by 1 to 2 AWWs each; whereas the Supervisors also failed to list 3 common reasons i.e., micronutrient deficiency, mouth lesions and stress.

6. Growth Monitoring and Promotion

Growth monitoring is a very important tool to promote correct IYCF practices. The knowledge and perceptions of AWWs and Supervisors' were assessed about GMP, to see if they were aware of the correct use of this tool.

Total 81% (29) AWWs recommended weighing child on a monthly basis and 14% (5) recommended once in 15 days. Overall AWWs listed 10 of 11 steps in GMP. Majority of the AWWs (69%) identified assessing nutritional status and counseling on IYCF as key step in GMP (Table I-18).

Only 64% (23) AWWs listed growth monitoring as an important tool for measuring growth and/or detecting growth faltering and 33% (12) AWWs related it as a tool for giving appropriate advice based on child's nutritional status.

Table I-18: Knowledge of AWWs Regarding Steps in Growth Monitoring and Promotion

Steps	AWWs % (N=36)
1. Find grade/nutritional status	69 (25)
2. Study the trend of change in weight	22 (8)
3. Plot on growth chart registers	44 (16)
4. Plot on *MAMTA* card	3 (1)
5. Inform mother /care giver child nutritional status	78 (28)

Steps	AWWs % (N=36)
6. Counsel mother on IYCF practices	69 (25)
7. Plotting of community growth chart	-
8. Refer sick child and/or severely malnourished child if required	28 (10)
9. Iron supplementation/ Give medicine if required	6 (2)
10. Give *Balbhog* / ANC snacks	6 (2)
11. Ask mother/caregiver to come back and have the child weighed next month	11 (4)

Both the Supervisors were partially aware of the importance of GMP. The Supervisors' listed the important steps after weighing the child i.e., informing the mother about the nutritional status of child, counseling and generating discussion with care givers; however none of them could enumerate all key actions after weighing.

7. Diet during Pregnancy and Lactation

All AWWs and Supervisors agreed that pregnant and lactating mothers require more diet. Further, 94% AWWs related increased requirement to baby's growth and around 42% AWWs mentioned that the requirement increases during lactation (Table I-19). Also, none of the Supervisors specifically recommended use of iodized salt, milk and milk products. The foods specified by Supervisors included fortified flour, fruits like banana and papaya, sprouts, green leafy vegetables 'GLVs' and *Anganwadi* centre snacks.

Table I-19: Knowledge on Reasons for Increase in Dietary Intake of Pregnant and Lactating Mother

Reasons	AWWs % (N=36)
– Take more food for herself	50 (18)
– Take more food for baby/ healthy baby	94 (34)
– During lactation period this requirement increases further	42 (15)
– During pregnancy she needs to take at least one and half time more food than usual	11 (4)
– Pregnant/ lactation mothers should take double food	39 (14)
– Pregnant women should take balance diet which should include cereals, pulses, oils, fruits, vegetables and milk	22 (8)
o Sprouts	44 (16)
o Milk and Milk Products	39 (14)
o Egg, Non Veg	14 (5)
o Jaggery	14 (5)
o Nutrient dense	14 (5)

Reasons	AWWs % (N=36)
○ Chana, Cereals, Pulses	14 (5)
○ Nuts and oil seeds	8 (3)
○ Ghee / oil	8 (3)
○ Mug/ *khichadi*	3 (1)
– Daily seasonal green leafy vegetables	53 (19)
○ Other Vegetables	6 (2)
– Daily seasonal fruits	44 (16)
– Fresh Food	3 (1)
– Only consume iodized salt	3 (1)

8. Inter Personal Counseling

Effective IPC is a key to any behavior change. All three key IYCF practices call for behavior change in community; hence it was important not only to assess the knowledge regarding IYCF and GMP, but also to assess the capacity of AWWs and Supervisors on successfully delivering messages. The AWWs could identify three of the five key steps in effective counseling which included listening (6%, 2), asking checking questions (22%, 8) and praising mother wherever appropriate (6%, 2). The two steps not listed by AWWs and Supervisors, included; empathized with her (e.g. in pain or anxious), and, offered necessary help if necessary, whereas, the Supervisors' did not list praising the mother wherever appropriate.

Discussion - Knowledge and perceptions of the Anganwadi workers and the Supervisors

The above results indicated that the knowledge and perceptions of AWWs and Supervisors on IYCF, GMP, IPC and diet during pregnancy and lactation, after state of art training in IMNCI and on job training was not satisfactory. The results are in agreement with the scenario of ICDS workers in the other regions of India as discussed in the following section.

1. Key IYCF Practices

In India, the National Consultative Meet in 2009 formulated the revised guidelines on IYCF, the guidelines laid due emphasis on the need for *Anganwadi* workers, ASHA, Dai's and other grassroots level workers to be empowered by basic, scientific information related to IYCF (Tiwari *et al.* 2010).

In the current study, it is clearly seen that the knowledge of AWWs and Supervisors on IYCF need improvement. The superficial knowledge of ICDS frontline workers may not be helpful in promoting and enhancing community based optimal IYCF

practices. This reiterates the need for strengthening their knowledge and attitude for enhancing community based optimal IYCF practices.

A recent study in five NRHM high-focus states of India i.e. Assam (Northeast), Bihar (East), Uttar Pradesh (North), Chhattisgarh (Central), Rajasthan (West), concluded that a considerable proportion of AWWs and ASHAs have knowledge gaps on key nutrition interventions, specifically on proper nutrition during pregnancy and infant feeding practices. This indicates potential issues related to supervision, Supervisors knowledge, AWW training, and information retention (Bajpai and Dholakia 2011). In the current study the knowledge of AWWs and Supervisors with regard to the three IYCF practices was average; with many AWWs mentioning starting CF with liquids and most of them including the Supervisors failing to mention continuation of breastfeeding till 2 years and beyond.

2. Breastfeeding

The same study, in five NRHM high-focus states of India, showed that AWWs lacked understanding of the two most basic standards in newborn nutritional practice—EIBF within the first 30 minutes of life and EBF for the first 6 months of life. This raises red flags about their ability to convey correct information to mothers (Bajpai and Dholakia 2011). In the current study, although 86% AWWs mentioned correct time for initiation of breastfeeding after birth, none of the AWWs and Supervisors listed mother and child survival as one of the key benefits of EIBF.

In a study on health workers in Ferozpur District, Punjab (BPNI and Y.G. Consultants and Services (P) Ltd 2009), 89% health workers (ANM and ASHA) advised not to give prelacteals, the reason stated was that the child may not develop immunity. In the current study 78% and 31% AWWs listed prelacteals as infectious and unhygienic respectively. However none of the AWWs and Supervisors knew that prelacteals may contain medication which may be harmful. This message may become useful to encourage caregivers to avoid giving prelacteal feeds.

For ensuring EBF till 6 months, it is vital that AWWs and Supervisors convince caregivers who come with complain of *"Not Enough Breast Milk"*. In the current study, only 19% AWWs recommended checking child's weight to resolve mothers' complain of *"Not Enough Breast Milk"* and none of the AWWs and Supervisors recommended checking frequency of urination despite IMNCI training. Similarly, study on health workers in Punjab showed that ASHAs and ANMs were still not clear about causes and intervention required to resolve mothers' problems about "insufficient supply of milk", "child crying and not taking milk" (BPNI and Y.G. Consultants and Services (P)

Ltd 2009).

The BPNI bulletin, 2006, highlights that, universal feeling among mothers is that they don't have enough breast milk for their baby, and health workers offer supplements of milk to treat this 'perception' rather than building confidence of the mother using counseling skills. Confusing messages flow from different quarters including health personnel. Most health personnel use their 'own' experience or old knowledge. Aggressive commercial promotion of baby foods using market and health care system leads to adoption of bottle-feeding as a modern way of feeding even in remote villages of India. A study on 133 AWWs from 3 adjacent districts of Orissa showed that on an average AWWs knowledge about breastfeeding was adequate. The mean score was lower in reasons of feeding failure and individual attitude and practice (Satpathy *et al.* 1995).

Contrary to popular belief, attaching the baby to the breast is not an ability with which a mother is born; rather it is a learned skill which she must acquire by observation and experience (Woolridge 1986). Thus the 5th step of the ten steps for successful breastfeeding (UNICEF/WHO/BFHI 2007) is to show mothers how to breastfeed and how to maintain lactation, even if they need to be separated from their infants. Correct breastfeeding technique is important to ensure successful breastfeeding. It has been reported that incorrect technique may contribute to breast engorgement, and in particular it is important for the baby to latch on to the breast correctly during feeding so that it can suckle effectively (Mass 2004). In order to do this the baby needs to be correctly positioned and new mothers may require advice on this (Mass 2004). In the current study, on average AWWs could list only 4-5, whereas the Supervisors listed 10 out of 11 signs of attachment, positioning and suckling. Only around one-third AWWs and one Supervisor had complete knowledge about reasons for breastfeeding at night, breastfeeding in side-lying position and use of both breasts. This poor knowledge and perceptions of AWWs would have a direct impact on mothers' failure to EBF the child.

In Gujarat, 12% mothers deliver next baby within 18 months of a previous birth and 29% deliver within 24 months (NFHS – 3 Gujarat 2008). Thus 28% children may not be breastfed for 2 years and beyond if a mother is not aware of breastfeeding during pregnancy. In the current study, the perception of AWWs and their Supervisors on this issue was based on their field learning. These field learning's are as a result of compromised way of living due to multiple contributors like lack of food, poverty and other, all resulting in compromised outcome like undernutrition. These are debatable since it may be the only option for mothers to follow when they cannot alter other

factors like lack of food etc. It is very important that this type of compromised advice is not given by AWWs and Supervisors, and their capacity is enhanced, so that they can ensure that mothers follow the correct guideline.

With reference to breastfeeding during illness, in the current study, given theoretical situation, very few AWWs advised continuing breastfeeding in sickness, although initially 94% agreed that breastfeeding should be continued in sickness. Similarly, a study by Singh and Vashist (1993) showed that 66%, 41% and 24% AWWs responded incorrectly that breastfeeding should be stopped if the mother is suffering from tuberculosis, malaria and diarrhea.

The National surveys in UK have shown that painful breasts are the second most common reason for giving up breastfeeding in the first two weeks after birth. One factor contributing to such pain can be breast engorgement (Snowden *et al.* 2001). Other problems commonly faced by breastfeeding mothers are breast abscess and cracked nipple, which may again lead to failure to EBF the baby.

In the current study, the knowledge of AWWs and their Supervisors with regard to breastfeeding during breast problem was very poor, revealing the superficial interactions of AWWs and their Supervisors with such mothers in community where such situations exist. Without proper guidance, these could lead to failure in EBF and breastfeeding in such situations.

3. Complementary Feeding

Inappropriate CF is one of the major causes of malnutrition in young children in developing countries. Education about food recommended for young children is of great importance in the prevention of chronic malnutrition (Aruldas *et al.* 2010). With regard to CF almost all AWWs (97%) and both Supervisors, in the current study, stated the correct age of initiating CF, however, only 14% AWWs had correct knowledge regarding continuation of breastfeeding till 2 years. None of the AWWs knew the complete reason behind breastfeeding till 2 years and beyond.

In the current study, the Supervisors and their AWWs listed 9-10 out of 14 identified food groups as the type of food recommended as complementary foods. Only 44% AWWs recommended food with thick consistency to be fed and a large percent of AWWs (67%) recommended liquid diets for children. However triangulating this perception with knowledge, it was seen that the knowledge of AWWs was adequate with 78% recommending mashed food at 6th month. This clearly shows a missing link to translate AWWs knowledge into their perception in day to day counseling. These incorrect perceptions are possibly the contributory reasons for reinforcing

incorrect beliefs among the community regarding feeding liquid foods as CF to children resulting in low energy and protein density in CF. This immense gap in knowledge of AWWs needs to be addressed to bring about transformation in community based CF practices.

A recent formative study on CF practices in Rural Uttar Pradesh also showed that the frontline health workers including AWWs are not aware of the critical link between CF and child malnutrition and its consequences. The study also showed that although the frontline workers had knowledge about the type of complementary food to be given to child, only 14% AWWs were completely aware of the recommended frequency and quantity of feed for various age groups (Aruldas *et al.* 2010). This is similar to the finding of the current study.

WHO recommends encouraging child to drink and eat during illness and provide extra food after illness to help child recover quickly (WHO/UNICEF 2006). In the current study 22% AWWs and both Supervisors recommended encouraging child to drink. Only 6% AWWs advised on continuing breastfeeding and 22% advised giving small frequent feeds. About one-fifth (22%) AWWs and one Supervisor advised on additional meal after illness.

According to UNICEF's conceptual framework, food, health, and care are all necessary, but none alone is sufficient for healthy growth and development (UNICEF 1990). All three elements must be satisfactory for good nutrition. Behaviors or practices related to how food is provided to children and fed to them have been found to influence nutrient intake (Gittelsohn *et al.* 1998). Programmes that include care are likely to be effective in increasing nutrient intake and improving growth and development of children from birth to 3 years (Engle and Lhotska 1999). The current study, demonstrated a very limited approach, knowledge and involvement of AWWs and Supervisors in encouraging child to take CF, reflecting a weak responsive feeding practices in the community.

4. Care during feeding

The growth and nutritional outcomes of children is dependent on a complex relationship between the intrinsic characteristics of the child and the competence of the mother in providing child care. Zeitlin *et al.* (1990) proposed that healthy, adaptable children may grow well and thrive even in the absence of good care, while extremely good care is required for the smallest and weakest children (LBW, those with poor appetites).

In the present study, the knowledge of AWWs and their Supervisors on care during

feeding was poor, with the AWWs and Supervisors listing only 2-4 of 11 care practices identified. Also, the perceptions of AWWs on early signs of hunger were limited to crying, which in fact may be the late sign of hunger and at times not at all related to hunger. On inquiring about reasons for poor appetite in children, total 47% AWWs and both the ICDS Supervisors listed sickness as a key reason for child not feeling hungry, whereas 1-2 AWWs and none of the Supervisors listed the other two crucial reasons i.e. micronutrient deficiency and mouth lesion.

5. Growth Monitoring and Promotion

In the present study, 81% AWWs recommended weighing child every month and 14% AWWs recommended fortnightly. About two-thrids (64%) of the AWWs listed growth monitoring as an important tool for measuring growth and/or detecting growth faltering and only one-third (33%) AWWs related it as a tool for giving appropriate advice based on child's nutritional status. Also, neither of the Supervisors could enumerate all key actions after weighing. This finding, calls for a need to address the gaps in knowledge and perceptions of AWWs and Supervisors and to enhance their capacity in GMP, which is an important tool for addressing undernutrition.

A study conducted on 48 Child Development Project Officers (CDPO's) of ICDS attending inservice refersherer training, showed that only 50-72% CDPO's could interpret the changes in the growth curve. The researchers concluded that these knowledge gaps among CDPOs could negatively affect subordinates. Thus in-service training of CDPOs should address these gaps to improve their knowledge of growth monitoring activities (Kapil *et al.* 1991). Further a study conducted by Basine *et al.* (1995) with 100 AWWs in Delhi concluded that, continuous education on various aspects of growth monitoring is needed for AWWs.

Observations of growth monitoring sessions, in a study to assess the knowledge and skills of 34 AWWs in Hoogly district of West Bengal revealed that less than two third of the AWWs weighed the children accurately and none of them plotted the weight on the growth chart (Chattopadhyay 2004).

A study by Daxini and Kanani (2008) in rural AWCs of Vadodara showed that, although the AWWs were aware of the objectives of Growth Monitoring (GM), this service was reduced to merely an exercise in taking and recording the children's weight, and the mothers were not given education on child's nutrition status.

6. Inter Personal Counseling

Even with regular weighing, growth monitoring is effective only if accompanied by

communication for behaviour change that results in the improved growth of the malnourished child. Previous studies on ICDS have noted that this does not often occur, perhaps because many AWWs are not fully conversant with the interpretation of growth cards/curves (Gopalan 1992) or because AWWs fail to effectively communicate the meaning of children's growth patterns to mothers (Vasundhara and Harish 1993).

A knowledge and communication needs assessment of community health workers in Pakistan showed that about four fifths of the workers described their communication skills as moderately sufficient and wanted improvement (Haq and Hafeez 2009). The IYCF counseling service requires skilled training in IYCF counseling, which enhances providers' motivation to reach families and build trust as there is dialogue about the child during pregnancy and around birth. It aims at behavior change and positions ICDS as 'true' child development programme rather than 'food for the poor' as it is perceived now (BPNI Bulletin 2006).

In the present study, the AWWs and their Supervisors could identify two to three of the five key steps in effective counseling which included listening, praising mother wherever appropriate and asking checking questions. This again showed a below average knowledge of AWWs and their Supervisors, which could be one of the principal barriers in bringing about behavior change, while promoting community based IYCF practices, as well as, various other intervention requiring IPC.

Summing up this section, the knowledge and perceptions of AWWs and their Supervisor's on the rationale behind application of optimal IYCF practices was poor. This is noted to be a critical gap that needs to be addressed, for preparing the ICDS frontline workers, in successfully promoting adoption of optimal IYCF practices by the community.

B. Undernutrition prevalence, and associated infant and young child practices of the care providers of the children under two years and pregnant women in third trimester

This section addresses the following specific objective of the study;

- ✓ **To assess the prevalence of undernutrition and associated IYCF practices of care providers of children under two years**

The baseline research findings are presented and discussed under the following heads:

A. Background characteristics' of the households
B. Infant and young child feeding practices
C. Utilization of Integrated Child Development Services for children under two years
D. Nutritional status of children under two years
E. Factors affecting the nutritional status of the children under two years

1. Background Characteristics' of the Households

The following section provides a profile of the demographic and socioeconomic characteristics of the households in the present study sample. The information on household characteristics and housing conditions provides a context for understanding the demographic, health, and nutritional situation of the study sample.

Profile of Sampled Households

A total of 673 households from two ICDS Supervisory Sectors (*Seja's*) having a total of 36 *Anganwadi* centers, including 575 households with at least one child below 2 years, and 108 households with pregnant women in third trimester were surveyed. There were 10 households which had both, pregnant women in third trimester and a child under two years; hence the total households studied were 673. As shown in Table I-20, out of the total sampled households, around 99% households belonged to the Hindu religion. The distribution of households by caste shows that 88% of the households belonged to other backward classes (OBC), scheduled caste (SC) and scheduled tribes (ST) respectively.

Kuppuswamy's socioeconomic status scale is an important tool in hospital and community based research in India. It was proposed in 1976 (Kuppuswamy 1981). This scale takes account of education, occupation and income of the family to classify study groups in to high, middle and low SES. Since complete information regarding father's education and occupation was not available, mother's education and occupation, along with family's income per month score was used to determine SES status of the household, based on the latest Kuppuswamy's SES scale, 2007 (Kumar *et al.* 2007).

Around 86% of the families had monthly income between Rs.980-4893 per month. The classification according to the Kuppuswamy's SES scale (2007) revealed that, a majority of the household 71.3% belonged to the upper lower status, followed by 19.6% in the lower SES status (Table I-20).

Table I-20: Background Characteristics of Households'

Background Characteristic	Households % (N=673)
Respondent	
– Mother	82.9 (558)
– Others e.g. Grandmother, Sibling, *Kaki*	1.0 (7)
– Pregnant women	15.8 (108)
Religion	
– Hindu	99.0 (666)
– Muslim	0.3 (2)
Caste	
– General	11.3 (76)
– SC	3.9 (26)
– ST	40.7 (274)
– OBC	43.5 (293)
Family monthly income – Socioeconomic Status Scale (SES), 2007	
– =979	1.6 (11)
– 980-2935	65.5 (441)
– 2936-4893	21.0 (141)
– 4894-7322	4.8 (32)
– 7323-9787	0.7 (5)
– 9788-19574	1.2 (8)
– =19575	0.6 (4)
Kuppuswamy's Socioeconomic Status Scale, 2007	
– Upper Middle (II)	0.6 (4)
– Lower Middle (III)	1.9 (13)
– Upper lower (IV)	71.3 (480)
– Lower (V)	19.6 (132)
– Missing	6.7 (45)

As presented in Table I-21 around 97.3% of households had access to protected source of drinking water. In 37.1% households the water source was located more than 50 meters away (i.e., 164 feet).

Globally there is increasing concern, that the health gains from investment in water supply are being compromised by the fact that water often becomes contaminated during distribution or transport to the home, and during storage and handling within the home. One of the key options for dealing with this problem is promotion of point-of-use water treatment and safe storage in the home (Nath *et al.* 2006). Thus**,** the storage and the facility for drawing drinking water are equally important for proper hygiene and sanitation. Regarding drinking water storage 74.9% had safe storage, whereas, only 58.4% household had facility for safely drawing drinking water from the container (Table I-21). The household usage of sanitation facility, was even poor, with, only 19.0% households and 19.1% children (U-2 yrs) were using toilets

(household and/or community) for defecation.

Table I-21: Household Water and Sanitation Condition

Indicators	Households % (N=673)
Drinking Water Source	
Safe	
- Tap	63.2 (425)
- Hand pump	26.3 (177)
- Sanitary well	5.9 (40)
- Tube well with motor	1.2 (8)
- Tanker or truck	0.7 (5)
Unsafe (Well; Unprotected dug well)	1.6 (11)
Drinking Water Location	
- Within premises of HH	39.5 (266)
- Outside premises of HH	59.3 (399)
Drinking Water Distance	
o <50 meters	21.8 (147)
o 50-100 meters	14.4 (97)
o >100 meters	22.7 (153)
Storage of drinking water (Container covered and kept on high platform)	
- Safe	74.9 (504)
- Partially Safe	18.9 (127)
- Unsafe	0.4 (3)
Safety of drawing drinking water from the container	
- Safe (Using doya /Water container with tap)	58.4 (393)
- Un safe	34.8 (234)
Sanitation Facility and Use	
Household with sanitary toilet in courtyard or compound	23.9 (161)
Household toilet usage	
- Community	0.7 (5)
- Open	78.0 (525)
- Household	19.0 (128)
Children having access and using household toilet	19.1 (110/575)

Background characteristics of Mothers of Children under two years and Pregnant Women

The background characteristics of mothers of children under two years and pregnant women are presented in the Table I-22. This data is presented separately for mothers of children (U-2 yrs) and pregnant women. The table shows that around 27% women have had no prior schooling or education, a majority of women (around

68%) completed primary or secondary level of education.

The information about the age of the women shows that majority (54-58%) were from the age group of 21-25 years. A relatively lower percentage (4-5%) were 31 years or above. Early pregnancy cases were also noted, with one of the pregnant women being 17 years of age.

It was important to note that around 5% mothers of children were engaged in farming and, majority of mothers i.e., around 91.5% were housewives. Also, among the pregnant women 3.4% were engaged in semi-skilled work like farming on daily wages.

Table I-22 : Background Characteristics of Mothers of Children under Two Years of age and Pregnant Women

Indicators	Mothers of Children U-2 yrs % (N=575)	Pregnant Women % (N=108)
Mother's education		
- Illiterate	25.0 (144)	25.0(27)
- Able to read and write / No formal education	1.6 (9)	2.8(3)
- Primary (1 to 7)	45.0 (259)	48.1(52)
- Secondary (8 to 10)	23.1 (133)	19.4(21)
- Higher secondary (11 – 12) or Graduation	4.3 (25)	4.7 (5)
Mother's age (in years)		
- 17	-	0.0(1)
- 18-20	14.1 (81)	8.3(18)
- 21-25	54.1 (311)	58.3(63)
- 26-30	19.7 (113)	16.7(18)
- >=31	4.9 (28)	3.7(4)
Mothers Occupation		
- Works from home	2.3 (13)	1.9(2)
- Works outside home	5.6 (32)	3.7(4)
- Housewife	91.5 (526)	94.4(102)
Hours spend outside home by working mothers	6.9 ± 2.52 (N=27)	8.0 ± 3.65 (N=4)
Type of Occupation of Mother		
– Business/self employed	0.3 (2)	0.9(1)
– Farming - own land	1.6 (9)	-
– Skilled worker (office Job)	0.5 (3)	-
– Semi-skilled worker (Farming – daily wages)	2.4 (14)	3.4(4)
– Unskilled worker (Labor/servant)	0.7 (4)	-
– Housewife	91.5 (526)	94.4 (102)

Indicators	Mothers of Children U-2 yrs % (N=575)	Pregnant Women % (N=108)
Mother's Monthly income - Kuppuswamy's Socioeconomic Status Scale-2007		
– =979	1.4 (8)	1.9 (2)
– 980-2935	1.2 (7)	-
– 2936-4893	-	0.9 (1)

Most of the mothers of children under two years had at least 2 pregnancies (Table I-23). With reference to the pregnant women cohort, the 108 pregnant women had 120 pregnancies so far. Total 35 out of 108 pregnant women were pregnant for the first time.

Table I-23: Profile of Mothers With Regard to Child Bearing

Child Bearing Status of Mother's	N	Min, Max	No Child	N	Min, Max	No Child
	Mothers of Children U-1 yrs N=353			Pregnant Women N=108		
Total pregnancy	742	1,8	-	120	0,5	-
Total live birth	688	1,7	-	94	0,4	44
– Male	289	0,4	120	36	0,3	74
– Female	399	0,6	113	58	0,4	70
Total dead	62	0,4	-	17	0,2	92
– Male	27	0,2	329	12	0,2	97
– Female	35	0,2	322	5	0,1	103
Aborted/miscarriage	39	0,3	327	9	0,1	99

Background Characteristics of Children

For the in-depth interview, total 575/943 children under two years were studied during the survey. About 55.7% (320) of surveyed children were males and 44.3% (255) females. Around 60.3% (347) of the children were in the age group of 6-23 months, and remaining 39.6% (228) in 0-5 month's age group. It was important to note that of the children covered, 19.3% (111/451) were low birth weight (< 2.5kg) as per information available from birth records and recall at the time of data collection. Also, 21.6% (124/451) caregivers of children had no information about the birth weight of the child.

Vaccination is an important basic child health program in existence for a long time. The vaccination status of children (12-23 mo.) during the interview was obtained in 52.5% (114/217) children, from vaccination and/or mother and child protection card (*MAMTA* card), 33.2% (72/217) by recall of care provider, and in case of remaining 13.8% (30/217) children, the information was obtained partially from card and recalls

both (Table I-24). It was noted that overall 99.1% children had received the BCG vaccine. However, there was a gradual decline in further vaccines received by children, thus only 86.6% were fully vaccinated till measles vaccine at around 9 months and overall 71.4% were fully vaccinated, including those who should be receiving booster dose at 18 months.

Table I-24 : Vaccination Status of Children (12-23 months)

Vaccine	% (N=217)
– BCG	99.1 (215)
– DPT1	98.6 (214)
– DPT2	96.8 (210)
– DPT3	91.2 (198)
– OPV1	98.6 (214)
– OPV2	96.8 (210)
– OPV3	91.2 (198)
– Measles	87.6 (190)
DPT-B (18-23 mo.)	66.4 (77/116)
Polio-B (18-23 mo.)	66.4 (77/116)
Vaccination Status (12-23 mo.)	
– Fully vaccination (till measles)	86.6 (188)
– Fully vaccination (including booster)	71.4 (155)
– Partially vaccination	27.2 (59)
– No Vaccination	0.5 (1)

***Note**: Percents may not add to hundred due to missing values*

Utilization of Maternal Health Care Services

Antenatal care (ANC) checkup of pregnant women is considered to be the best opportunity for counseling the pregnant women and her family members on informing and counselling about breastfeeding, especially early initiation of breastfeeding. Table I-25 shows that although 97.7% mothers' with children under one year had at least one ANC visit during pregnancy, 26.4% had delivered the index child at home.

Table I-25: Utilization of Maternal Healthcare Services

Indicators (Children under 1 year)	% (N=352)
Number of ANC visits	
– None	2.0 (7)
– One or Two	12.5 (44)
– Three or more	85.2 (300)
Place of delivery	
• Government hospital (District or CHC or PHC or SC)	34.7 (122)
• Private hospital	28.1 (99)
• NGO or TRUST hospital	10.5 (37)

Indicators (Children under 1 year)	% (N=352)
• At home	26.4(93)

Discussion - Background Characteristics of Households

The current study area was a semi tribal area, approximately 30 km from the city of Vadodara. Thus, the findings of the current study are mainly being compared with the statistics of DLHS-3 for Vadodara and Gujarat rural (DLHS–3 2010).

Profile of Sampled Households

In the present study, majority of the households belonged to Hindu (99%) and 89% households belonged to OBC, SC and ST respectively. The DLHS–3 surveys showed that in rural Gujarat, 94.3% of household heads are Hindus, and around 80.8% rural households belonged to SC, ST and OBC caste (DLHS–3 2010).

Comparing the wealth index, the DLHS-3 showed that in rural Vadodara 72.2% household had lower standard of living index (DLHS–3 2010). Similarly in the current study, using the Kuppuswamy's SES scale – 2007, 71% households belonged to the upper lower status, followed by 19.6% households in the lower SES status. Here it is important to note that the methods used for estimating the above SES index were different in the DLHS-3 and present study.

Access to safe drinking water and sanitation, is not only an important measure of the SES of the household but is also fundamental to the health and nutrition well-being of vulnerable groups such as children under two years. The sources of protected drinking water was little better, than DLHS-3 survey, in the current study area, with 97.4% household having access to protected source of drinking water. The DLHS-3 survey showed 86.7% household in rural Gujarat had improved source of drinking water, further the survey reported 47.6% household in rural Vadodara using pipeline drinking water (DLHS–3 2010).

Lastly, even though toilets were constructed in 23.6% households in the current study, defecation in open was practiced by 78% families. This was similar to the DLHS-3 findings which which showed that 71.7% families practiced defecation in open in rural Gujarat (DLHS–3 2010).

Background Characteristics of Mothers of Children under two years and Pregnant Women

The status of women's education in the current study was better than the DLHS-3 survey, which showed 49.6% currently married women (15-44 years) being non-literate in rural Gujarat (DLHS–3 2010) as compared to only around 27% women in

the current study having no prior schooling or education.

As per DLHS-3, the Mean Children Ever Born (MCEB) to ever married women (15-49 years), ratio was 2.7 in rural Gujarat and 2.4 in Vadodara district. In the current study, the mean number of children born in study area was 2.1. Similarly, the NFHS-3 findings for Gujarat also showed that at current fertility levels, a woman in rural Gujarat will have an average of 2.8 children in her lifetime ((NFHS-3 2007).

Thus, overall the background characteristics of women in the study population were similarl to the recent DLHS-3 findings for rural Vadodara and Gujarat. Also, it is important to note that the current study population consisted of mothers having children below 2 years, whereas the DLHS-3 study presented the findings, for women in reproductive age groups i.e.15-44 years.

Background Characteristics of Children

Birth weight, is an important indicator of a child's vulnerability to the risk of childhood illness and chances of survival The NFHS-3 study showed that the infant mortality rate (IMR) increases, with the decrease in birth weight (average or large size baby IMR 49; smaller than average baby IMR 62 and very small baby IMR 129). Among children for whom birth weight was reported, 23% children in rural India and 22% children in Gujarat had a LBW (<2.5 Kg) (NFHS-3 2007). Similarly, in the present study, 19.3% children under two years had LBW.

The universal immunization of children against the six vaccine-preventable diseases (namely, tuberculosis, diphtheria, whooping cough, tetanus, polio, and measles) is crucial to reducing infant and child mortality. According to WHO, children are considered fully vaccinated when they have received a vaccination against tuberculosis (BCG), diphtheria (3 dose), whooping cough (pertussis), tetanus (DPT) vaccine; poliomyelitis (polio, 3 dose); and measles (1 dose) vaccine by the age of 12 months. Based on information obtained from immunization card or reported by the mother ('either source') the NFSH-3 data showed that 54.2% of children (12-23 mo.) in rural India, and 65.7% in Gujarat were vaccinated upto measles (NFHS-3 2007). The DLHS-3 findings revealed that, 70.1% of children (12-23 mo.), in rural Gujarat, and 73.4% in rural Vadodara district, received vaccination upto measles (DLHS–3 2010). The trends regarding increase in vaccination coverage continued further, in the present study, with 86.6% children (12-23 mo.) vaccinated upto measles vaccine.

Utilization of Maternal Health Care Services

Antenatal care (ANC) refers to pregnancy-related health care, which is usually

provided by a doctor or health care professional like ANM etc. Antenatal checkup is also a very important monthly activity, which gives opportunity to health care providers in providing nutrition and health education to pregnant women.

The NFHS-3 results showed that around 72% (rural India) and 86.7% (Gujarat) women received at least one antenatal checkup for their most recent birth (5 years preceding the survey). Further, 67.5% women in Gujarat also received 3 or more ANC visit (NFHS-3 2007). The recent DLHS-3 study showed that in Vadodara district, only 50.2% mothers had 3 or more ANC checkup during the last pregnancy (DLHS–3 2010). The current study area had a better ANC coverage, with 85.2% of the mothers with children below 1 year, having 3 or more ANC checkup visits during their pregnancy.

Also, regarding the institutional delivery, the DLHS-3 results showed that 42.2% women[4] in Vadodara district and 44% in Gujarat had delivery at home. Contrary to this finding, in the current study only 26.4% women delivered the index child at home. Thus to conclude, in the present study area, the MCH services particularly ANC checkup were availed of by larger number of women's then the overall picture of Gujarat, Vadodara district and Rural Vadodara as presented in NHFS-3 and DLHS-3 survey respectively. As a result, not only the full ANC coverage, but institutional delivery rates in the present study area were better than the state and national survey.

2. Infant and Young Child Feeding Practices

Breastfeeding is an unparallel way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications on mothers' health. As a global public health recommendation, infants should be exclusively breastfed for the first 6 mo. of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe CFs while breastfeeding continues for up to 2 years or beyond. Exclusive breastfeeding from birth is possible except for a few medical conditions, and unrestricted exclusive breastfeeding results in ample milk production (WHO 2002).The Infant and Young Child Feeding Guidelines (2010) endorsed by Indian Academy of Pediatrics recommends that breastfeeding should be initiated within one hour of childbirth. Also, the Government of India advocates that all infants should be fed colostrum and exclusively breastfed for the first 6 mo. of life (Tiwari *et al.* 2010). Subsequently,

[4] Represents figure for currently married women aged 15-44 years

breast milk should be complemented with semi-solid foods. The CFs should be fed appropriately in order to provide sufficient nutrients for optimal growth. This implies correct age of introduction of semisolid foods, frequent feeds (3 to 5 times/ day) and with adequate density of energy and other nutrient.

The WHO, introduced following set of eight core and seven optional indicators for assessing infant and young child feeding (IYCF) practices by large-scale surveys; (WHO 2008 and WHO 2010). The definition and formulae to calculate the indicators presented in Annexure 11.

Core indicators	Optional indicators
1. Early initiation of breastfeeding 2. Exclusive breastfeeding under 6 mo. 3. Continued breastfeeding at 1 yr 4. Introduction of solid, semi-solid or soft foods 5. Minimum dietary diversity 6. Minimum meal frequency 7. Minimum acceptable diet 8. Consumption of iron-rich or iron-fortified foods	1. Children ever breastfed 2. Continued breastfeeding at 2 yr 3. Age-appropriate breastfeeding 4. Predominant breastfeeding under 6 mo. 5. Duration of breastfeeding 6. Bottle feeding 7. Milk feeding frequency for non-breastfed children

The following section presents the findings on the IYCF practices of the study groups using the calculations provided for the above indicators in WHO publication, "Indicators for assessing IYCF practices Part II: Measurements" (WHO 2010). The section would also describe the knowledge, perceptions and practices of mothers of children (U-2 yrs) and pregnant women's regarding IYCF.

a) *Breastfeeding*

Knowledge and Perceptions of Breastfeeding Practices

The knowledge and perceptions of pregnant women and lactating mothers (having children below 1 year) about optimal breastfeeding practices will have a strong impact on the actual breastfeeding practices of children below 2 years. Thus, it becomes important that the service providers like *Anganwadi* workers (AWWs) counsel pregnant women and lactating mothers from time to time on optimal breastfeeding practices.

In the present study, the knowledge and perceptions of pregnant women and lactating mothers was assessed at baseline, besides the actual assessment of the IYCF practices of care providers of children below 2 years (discussed later in this section).

Overall, it was observed that the knowledge and perceptions score of pregnant women and lactating mothers was around 40% and 45% respectively (Table I-26). The score was calculated based on appropriate responses given by pregnant women and lactating mothers to the question related to optimal breastfeeding practices.

Table I-26: Knowledge of Pregnant and Lactating Mothers' on Breastfeeding Practices

Indicators	Pregnant Women % (N=108)	Lactating Mother's % (N=352)
– Appropriate	40.6	45.7
– Inappropriate	38.1	39.3
– Don't know/ Can't Say	15.6	9.6
– Missing	6.3	3.1

- ***Early Breastfeeding Practices***

The knowledge and perceptions of pregnant women on early breastfeeding practices i.e. EIBF (38.9%, 42), colostrum feeding (40.7%, 44) and prelacteals feeding (20.4%, 22) was very low.

- ***Exclusive Breastfeeding***

Assessing mothers' knowledge and perceptions of exclusive breastfeeding (EBF), it was seen that only 23.1% (25) pregnant women and 44.3% (156) lactating mothers were aware of the correct duration of EBF. Around 36% (39/108) pregnant women and 30% (104/325) lactating mother's perceived duration of EBF, as less than 6 months. The pregnant women recommended duration of EBF ranging from 1-24 months, whereas the lactating mother's recommended duration of EBF ranging from 0-30 months.

- ***Continued Breastfeeding***

As low as, 13% (14) pregnant women and only 16.8% (59) lactating mothers were aware of continuing breastfeeding till 2 years and beyond, whereas, 5.6% pregnant women and 7.1% lactating mothers perceived that breastfeeding should be continued for around 3 to 6 years. Most of the women, 47.2% (51/108) pregnant women and 53.7% (189/375) lactating mothers, recommended continued breastfeeding for around 12-23 months. Some of the mothers also perceived that breastfeeding should be continued till a certain milestone was achieved such as; *till milk comes, till next child birth, when child learns to sit, walk, starts eating, till baby wants, till child becomes 'hoshiyar' (i.e., can understand things).*

Breastfeeding Frequency, Duration and Adequacy

Among pregnant women, 46.3% (50) recommended to breastfed on time schedule and 42.6% (46) recommended breastfeeding on demand. Most of the lactating mother's believed that child should be breastfed on time schedule (71.9%, 253), and, only 25.6% (90) lactating mothers recommended breastfeeding on demand.

As low as, 26.9% (29) pregnant women and only 42.3% (149) lactating mothers were aware of the minimum frequency of breastfeeding as 8-12 times. This correlated with the poor knowledge and perceptions of mothers on breastfeeding duration. Only 24.1% (26) pregnant women and 39.3% (103) lactating mothers could specify the minimum duration of breastfeeding (20-30 minutes). It was important to note that around 30% pregnant and lactating mothers perceived that, child should be breastfed for around 5 to 10 min. This inappropriate knowledge of mother's about frequency and duration of breastfeeding may be the key reason behind suboptimal breastfeeding practices.

On further assessing the mother's knowledge and perceptions of the use of both breasts while breastfeeding, and use of alternate breast during each feed, around 85.2% (92) pregnant women and 89.5% (315) lactating mothers responded offering another breast, when child leaves one breast and 69.4% (75) pregnant women and 78.7% (277) lactating mothers advised on using alternate breast during each feed.

However, none of the mother's had appropriate knowledge on deciding, whether her milk is adequate for the baby, except for one pregnant woman.

Benefits of Breastfeeding

As presented in Table I-27, not many mothers were aware of the benefits of breastfeeding. Around 25% pregnant and lactating mothers were aware that breastfeeding enhances baby's immunity, whereas, 14% lactating mothers perceived breast milk as good for baby.

Table I-27 : Knowledge of Pregnant Women on Benefits of Breastfeeding

Indicators	Pregnant Women % (N=108)	Lactating Mother's % (N=352)
Benefits of breastfeeding for a child		
• Growth and Development	1.9 (2)	26.1 (92)
• IQ/ Intelligence/ brain development	2.8 (3)	1.7 (6)
• Immunity / Healthy	25.0 (27)	23.9 (84)
• Other benefits Such as: stomach gets full; Good for baby; Gets all nutrition Many benefits; Breast size; Cry ; Breastfed ; Grow early; Good; Blood increases; Grow well/ old/ big ; Feeding the baby ; Happy; Sleep; Sick; Cry ; peaceful; Many benefits; Best food; *Good body;* Walk	25.9 (28)	40.1(44)

- ***Breastfeeding and Mother's health***

The knowledge and perceptions of pregnant and lactating mothers' on impact of breastfeeding on mother's health and pregnancy outcome was very poor. It was noted that only 51.9% (56) pregnant women and 78.4% (276) lactating mothers recommended taking extra diet during pregnancy and lactation. Overall, only 12.0% (13) and 9.9% (35) pregnant and lactating mothers knew that breastfeeding helps in delaying next pregnancy, and, around 25% of them recommended continued breastfeeding during pregnancy. Around 47.2% (51) pregnant women and 38.1% (134) lactating mothers knew that breastfeed can help mothers to reduce weight.

To summarize, the poor knowledge and perceptions of mothers of children below 2 years, shows the urgent need of enhancing their knowledge and perceptions on optimal breastfeeding practices. This further highlights the critical role of community frontline workers like AWWs in enhancing the knowledge and perceptions of care providers of children below 2 years, for achieving optimal IYCF practices.

Counseling on Breastfeeding Practices

In order to understand the scenario further, the mothers were interviewed to assess, the role of community workers specially AWWs regarding counselling of mothers on breastfeeding practices. Early registration of pregnancy, antenatal checkup and post natal IMNCI visits provides excellent repeated opportunities for AWWs to counsel the mothers and her family member on various health and nutrition care practices, for mother and child, including the IYCF practices.

- ***ANC Checkup and Breastfeeding Counseling***

During the survey, a brief history of the lactating mother regarding the status of ANC

checkups and breastfeeding counseling received during last pregnancy was taken. It was observed that 97.7% (344/352) mothers had ANC checkup at least once during the last pregnancy and 71% (250/352) of all lactating mothers had received breastfeeding counselling during the last pregnancy. Except for one mother, all the mothers who had received breastfeeding counselling had ANC checkup. There was a statistically significant (X^2=*10.26* p<0.01) association between mothers who had more than 3 ANC visits and counselling on breastfeeding (210/271) as compared to those who had less than or equal to 3 ANC visit and counselling on breastfeeding (39/67).

- ***Sources of Counseling and Key Messages on Breastfeeding***

Table I-28 describes briefly the key place and source of counselling on breastfeeding during pregnancy. As informed by the lactating mother's, majority of them (54.8%) received counseling on breastfeeding on *MAMTA DAY* and the source of counselling was mainly ANM/FHW (37.2%) followed by AWWs (15.1%).

Table I-28: Counseling on Breastfeeding during Pregnancy - Sources

Indicators	% (N=352)
Counseling on Breastfeeding (Yes)	**71.0 (250)**
Place of Counseling (all sources)	
– *MAMTA DAY* (SC, PHC, AWC)	54.8 (193)
– Private hospital	15.1 (53)
– Government hospital/CHC Referral	9.4 (33)
– PHC/SC (other than *MAMTA DAY*)	3.4 (12)
– Home/ Neighbor	2.6 (9)
– Trust Hospital	1.4 (5)
Counseling Source	
– ANM/FHW	37.2 (131)
– *Anganwadi* Worker	15.1 (53)
– Private doctor/nurse	11.1 (39)
– Government doctor/nurse	7.9 (28)
– ICDS Supervisor/Supervisor	2.6 (9)
– LHV/FHS	1.7 (6)
– Village Volunteers; ASHA Job training; DCT; MPHW; Nursing college	4 (14)
– Relatives like mother in law, friends, neighbor	2.1 (7)
– Television	0.3 (1)

As described in Table I-29, 71.3% women received counseling during pregnancy on early initiation of Breastfeeding (EIBF), whereas, only around 50% women received counseling on colostrum feeding, no prelacteal feeding and EBF, during pregnancy. It was important to note, that only 10% (no prelacteal) to 15% (EIBF) women were

counseled by AWWs during pregnancy. Such a low percentage shows the clear neglect of AWWs regarding counselling pregnant women on early breastfeeding practices.

Post pregnancy, post natal visits, immunization and growth monitoring of infants are the most important contact point for counseling of mothers. Overall 70% mothers were counseled on growth monitoring including only 41.7% by AWWs. Further, it was seen that only 8% (expression of breast milk) to 12% (breastfeeding attachment, positioning) mothers were counseled by AWWs on breastfeeding (Table I-29).

Table I-29: Counseling on Breastfeeding during Pregnancy and After Child Birth (N=352)

Counseling	During Pregnancy % (N)		After child birth % (N)	
	All sources	AWWs	All sources	AWWs
✓ EIBF (within 1 hr)	71.3 (251)	15.1 (53)	56.0 (197)	2.9 (10)
✓ Colostrum Feeding	46.3 (163)	11.1 (39)	36.1 (127)	1.7 (6)
✓ No prelacteal feed	48.6 (171)	10.8 (38)	46.6 (164)	5.0 (17)
✓ EBF	52.6 (185)	12.8 (45)	58.0 (204)	8.7 (30)
✓ BF Positioning	-	-	60.5 (213)	12.0 (41)
✓ BF Attachment	-	-	60.5 (213)	12.2 (42)
✓ Expression of breast milk	-	-	45.7 (161)	8.2 (28)
✓ Kangaroo Mother Care	-	-	31.0 (109)	7.3 (25)
✓ Keep baby warm	-	-	55.4 (195)	9.3 (32)
✓ Growth Monitoring	-	-	70.5 (248)	41.7 (143)

To summarize, the counseling on breastfeeding by AWWs was poor, clearly indicating low priority given by AWWs to counseling on breastfeeding practices while interacting with pregnant and lactating mothers.

Children Ever Breastfed

In the present study, information on breastfeeding practices was obtained from 356 lactating mothers of infants 0-12 months.

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Children ever breastfed** as, proportion of children born in the last 24 months who were ever breastfed to the total children born during that period (IYCF indicator 9).
- ✓ **Predominant breastfeeding under 6 months** as proportion of infants 0–5 months of age who are predominantly breastfed of the total infants 0-5 months of age (IYCF indicator 12).
- ✓ **Duration of breastfeeding** as median duration of breastfeeding among children

0–35 months of age i.e. the age in months when 50% of children 0–35 months did not receive breast milk during the previous day (IYCF indicator 13).

- ✓ **Age-appropriate breastfeeding** as proportion of children 0–23 months of age who are appropriately breastfed (IYCF indicator 11) i.e., Infants 0–5 months of age who received only breast milk during the previous day and Children 6–23 months of age who received breast milk, as well as solid, semi-solid or soft foods, during the previous day.

It was noted that almost all children (99.2%, 0-12 mo.) were breastfed. Also the current breastfeeding rate among children (U-2 yrs) was 93.4% (537/575) and, 84.1% children (U-6 mo.) were predominantly breastfed. The median duration of breastfeeding among all children (U-2 yrs) was 7 months. The age appropriate breastfeeding rate was 57.8% (305/527).

Early Breastfeeding Practices

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Early initiation of breastfeeding** as the proportion of children born in the last 24 months who were put to the breast within one hour of birth (IYCF indicator 1).

Table I-30 presents the early breastfeeding practices followed for children below one year of age. Overall, 73.4% of the infants delivered normally were initiated on breastfeeding within one hour of birth and 54.8% of the infants delivered through C-section were initiated breastfeeding within four hours of birth.

Delay in initiation of breastfeeding deprives a child not only from receiving colostrum, but causes delay in release of hormones promoting increase in flow of breast milk. Delay in initiation of breast milk also results in introduction of prelacteal feeds (food items which are given before initiating breastfeeding). These include foods such as sugar, honey, jaggery (*gur*), glucose, formula milk and others. These prelacteal food items are main carriers of intestinal infections; diarrhoea is commonly seen in children receiving prelacteals.

In the present study, around 60% mothers of children under 6 months reported to have fed colostrum completely, and, many mothers (28.6%) reported having discarded first few drops of colostrum owing to family rituals and false beliefs. Also 36.5% mothers of children below one year gave the index child prelacteal, something to drink other than breast milk in the first three days of delivery. The most commonly given prelacteals was '*Patasa water'* or *Jaggery*. It was found that a majority of them gave prelacteals because of custom/ritual (10.4%).

Table I-30: Early Breastfeeding Practices among Children Below one Year of Age

Indicators	% (N)
Status of Breastfeeding initiation (Normal Delivery babies)	**N=320 Cum.% (N)**
- Immediately	61.3 (196)
- Within 1 hour	73.4 (235)
Status of Breastfeeding initiation (C-section Delivery)	**N=31 Cum.% (N)**
- Immediately	25.8 (8)
- Within 1 hour	41.9 (13)
- Within 4 hours	54.8 (17)
Prelacteal feeding (U-12) (yes)	36.5 (130)
Types of Pre-lacteal feeding given	
– *Patasa* Water	9.0 (32)
– Jaggery	9.3 (33)
– Animal milk like cow and goat milk	7.6 (27)
– **Other prelacteals**: Powder/ tinned milk, sugar water, honey (6-7%); water, glucose, ghee, gutti, IV (1-3%)	
Key reasons for giving Pre-lacteal feeding	
– Custom / ritual	10.4 (37)
– No milk after delivery	8.7 (31)
– Advised by hospital people	3.9 (14)
Other reasons for giving pre-lacteal like caesarian, adviced by other, crying, *LBW*, mother not able to feed baby, everybody says, less milk, So that child pass stool, mouth dry, '3 *divase dudha ave*'-Milk comes after three days	
Colostrum Feeding (U-6)	**% (N=220)**
– Yes, without discarding	59.5 (131)
– Yes (discarded few drops)	28.6 (63)
– Yes (given after 2 days,)	7.7 (17)

For attaining EBF, the mother's also need to ensure that the child is breastfed for appropriate duration each time (minimum 20-30 minutes per feed), frequency (minimum 8 to 12 breastfed per day) and mother is able to correctly assess the adequacy of breastfeeding (assessing whether the child is full or not). This can only be attained when mother's follow the proper attachment and positioning during breastfeeding. In the current study, only 47% (93/198) mothers (children U-6 mo.) fed a minimum 8 to 12 feeds in 24 hours preceding the survey, the mean number of breastfeed per child was 10.4±4.07 and, the number of breastfeeds ranged from minimum 3 to maximum 26 in 24 hours. Also 26.3% (52/198) were breastfeed less than 8 times and 26.8% (53/198) were fed more than 12 times in 24 hours preceding the survey.

Practice of Exclusive Breastfeeding and Continued Breastfeeding

The UNICEF WHO Global strategy for IYCF, 2003 recommends exclusive breastfeeding *(no other liquid or solid food from any other source is given to an infant other than breast milk*) till 6 months of age and thereafter appropriate and adequate complementary feeding from the family pot along with continued breastfeeding till two years or beyond (Tiwari *et al.* 2010).

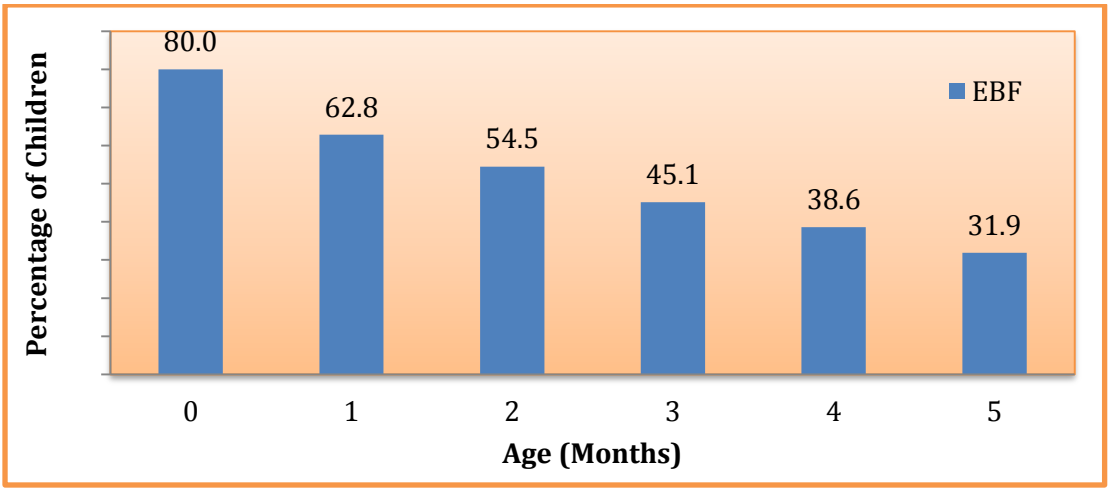
Exclusive Breastfeeding

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Exclusive breastfeeding under 6 months** as the proportion of infants 0–5 months[5] of age who are fed exclusively with breast milk (IYCF indicator 2).

It is recommended that the indicator be further disaggregated and reported for the following age groups: 0-1 months, 2-3 months, 4-5 months and 0-3 months, if sample size permits (WHO 2010). Figure I- 1 indicates that, among children under 6 months, only 31.9% (72/226) children were currently EBF. On inquiring further, only 44.6% (29/65[6]) mothers were willing to EBF till 6 months of age.

Figure I- 1: Status of Exclusive Breastfeeding among Children Under 6 months (Cumulative)



***Note**: EBF status refers to a "24-hours" period (yesterday and last night).*

Figure I-2 shows the most common non-breast milk items given to children under 6 months. It was noted that majority of the children were given water and prelacteals, followed by animal and/or other milk. Water was introduced in around 16.7% children

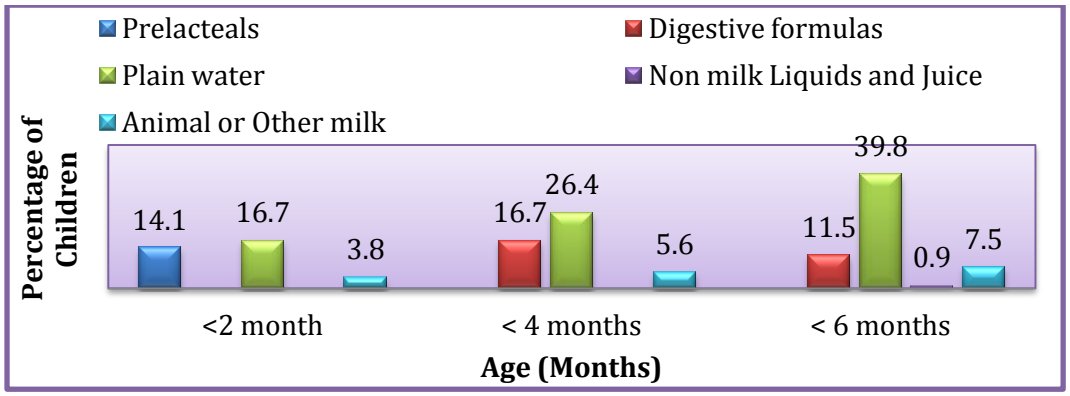
[5] Age groups are described in intervals of months completed. For example, infants 0–5 months of age have completed 5 months but are less than 6 months (or 183 days) old.

[6] *Missing values due to error in data collection*

below 2 months, which increased to 39.8% among children under 6 months.

It was important to note that although 36.5% mothers of children below 1 year stated that they gave prelacteals at birth (Table I-30) digestive formulas such as *Babuline*, Gripe water was given to around 16.7% children, mostly introduced by 4th month of age.

Figure I- 2: Feeding of Non-breast Milk Items among Children under 6 months



Continued Breastfeeding

The UNICEF WHO Global strategy for IYCF, 2003 recommends continued breastfeeding after a period 6 months, through the first and second year of life as well as beyond, as it is an important source of energy and high quality nutrients (WHO/UNICEF, 2003).

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Continued breastfeeding at 1 year** as proportion of children 12–15 months of age who are fed breast milk (IYCF indicator 3).
- ✓ **Continued breastfeeding at 2 years** as proportion of children 20–23 months of age who are fed breast milk (IYCF indicator 10).

In the present study, the data regarding status of continued breastfeeding was assessed at 1 (n=64; 12-15 mo.) and 2 (n=71; 20-23 mo.) years. The findings indicate that 10.9% of the mothers were not offering breast milk to their children at one year and around a one-third (32.4%) mothers stopped breastfeeding by 2 years.

Bottle Breastfeeding

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Bottle feeding** as, the proportion of children 0–23 months of age fed with a bottle during the previous day (IYCF indicator 14).

Bottle feeding has a direct effect on the mother's exposure to the risk of pregnancy

because the period of amenorrhea may be shortened when breastfeeding is reduced or replaced by bottle feeding. Since it is often difficult to sterilize the nipple properly, the use of bottles with nipples also exposes children to an increased risk of getting diarrhoea and other diseases. Overall use of bottles with nipples among children below 12 months was 8.4% (30/358), whereas currently only 5.6% (20) children below 12 months were bottle fed. Most of the mothers started bottle feeding on their own (8.1%, 29) without any other person's advice, and most used bottle for feeding milk (6.7%, 24). Some of them also gave water (2.2%, 8) and sugar water (0.6%, 2) using bottle. The mean duration of bottle feeding was around 3.1±3.2 months, and duration of bottle feeding ranged from less than 30 days to maximum 15 months.

Problems in Breastfeeding

Continued breastfeeding and EBF is many times not attained when mothers have problem in breastfeeding. Problems in breastfeeding like breast engorgement, breast abscess etc if not addressed in time, may lead to abstinence from breastfeeding. Around 8.6% (19/120) mothers, of children under 6 months, reported having problem in breastfeeding, majority of the mothers who experienced problems reported facing problem of insufficient milk (57.9%, 11/19) and breast engorgement (36.8%, 7/19). Around 3.6% (8/19) of mothers, who experienced problem, discontinued breastfeeding and/or started giving top milk. Discontinuation of breastfeeding was mainly the decision of the mother in one fourth of the cases (26.3%, 5/19), whereas, the remaining one sixth of the cases, reported to discontinue on doctor's advice (15.8%, 3/19). The problem of sore nipple and breast abscess was reported by one mother each (5.3%, 1/19).

b) *Complementary Feeding*

After 6 months, it becomes increasingly difficult to meet the infants' nutritional needs from breast milk alone. Therefore, 6 months is the appropriate age to introduce semi-solid foods along with continued breastfeeding (WHO 1998a).

Age of Introduction of Complementary Foods

The Guiding Principles for Complementary Feeding of the Breastfed Child recommends (WHO/PAHO 2003);

- To practice exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfed.

The knowledge and perceptions of mothers of children below 1 year was assessed on three key aspects with reference to the age of introduction of complementary food (CF) i.e. age of introduction of top milk, solid and semi solid food and food from family pot or meal

Around 24.8% (57/230) mothers, of children under 6 months recommended introduction of top milk from 6 months onwards, and 15.5% (36/230) mother's recommended before 6 months. On an average most of the mother's recommended to introduce top milk around 8-9 months. However, the response of mother's ranged from 0-30 months.

It was observed that only 30.9% (71/230) mothers of children under 6 months, knew the correct age of introduction of CF, and the response of mother's ranged from 3-24 months. On an average most of the mother's recommended to introduce CF around 7-8 months onwards.

Lastly with regard to the knowledge and perceptions of the mothers of children (0-12 mo.) regarding introduction of food from family pot or meal, only 18.8% (65/346) mother's perceived that child can eat food from family pot by 1 year. Most of the mother's believed that child can eat food from family pot at only around 22-23 months. The responses of mothers ranged from 5-60 months. Overall, the knowledge and perceptions of mother's on age of introduction of CF was very low.

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Introduction of solid, semi-solid or soft foods** as proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods during the previous day (IYCF indicator 4).

The actual assessment of practice showed that the introduction of solid, semi-solid or soft foods was 69.2% (45/65) among children 6-8 months in the present study. The data (

Table I-31) regarding the status of initiation of semi-solid foods reveals that, overall, 40.5% children (6-23 mo.) were receiving top milk and, 11.3% (39/346) were introduced top milk before 6 months.

Overall, only 37.9% children initiated CF from 6 months onwards. Among children 12-23 months, early introduction of CF before 6 months and late introduction beyond 8 months was observed in around 12% and 25% children respectively. The age of introduction of CF ranged from 2-18 months.

Table I-31: Status of Initiation of Complementary Food

Indicators	% (N)
Top milk (6 -23 months)	**N=346**
• Receiving top milk	40.5 (140)
• Mean age of initiation of top milk (N=140)	7.9 ± 5.11
Solid, Semi-Solid or Soft Foods	
6-23 months	**N=346**
• Received solid food	92.2 (319)
• Initiated solid food at 6th months	7.9 (131)
12-23 months	**N=218**
– Introduced before 6 mo.	11.9 (26)
– Introduced between 6-8 mo.	59.2 (129)
– Introduced beyond 8 mo.	24.8 (54)
– Still not been introduced semi solid foods	1.4 (3)
– Mean ± SD (N=209)	7.6 ± 2.98

Responsive Feeding

The Guiding Principles for Complementary Feeding of the Breastfed Child recommends (WHO/PAHO 2003);

- Practicing responsive feeding, applying the principles of psychosocial care.

Table I-32 presents the knowledge and perceptions of mothers of children below 2 years about responsive feeding practices. The assessment was made based on three questions related to the knowledge and perceptions, i.e. appropriate age for allowing the child to eat by self, whether to monitor child while eating and mother's recommendation when child refuses to complete the given food.

Only 22.8% mother's believed that child can eat by self at around 2 years, whereas, 28.1% mother's reported it as below 2 years. The mean age recommended was around two and half years (27.4±14.1mo., N=261), ranging from 6 to 72 months.

Further, 83% mothers of children under two years believed that caregiver should sit and monitor how child eats, one of the care givers also adviced to "give food to child in a separate dish, to monitor how much child ate".

Lastly when inquired about what would the mother do if child refuses to complete the given food, majority of the mothers advised to leave the child alone (34.3%, 197/575). The mother's believed; *'Jetali bhukha lage etalu khaya'- child would eat as much as it is hungry. 'Ek time na khaya tho su karvanu' nothing needs to be done if child won't eat once in a while*

Around 30.3% (174/575) mothers believed in getting the child to complete the food

by encouraging the child. The mother's responded; '*khavadavu tho padsene' – we have to make the child eat; 'pataye pataye ne jamadavu' – we have to encourage the child to eat; 'khavanu api kame lagiye' – I only start working after giving the food; 'bhukhi na reva dav' – I never leave my child hungry.*

Also, 10.3% (59/575) mothers recommended, to offer children something else to eat like milk, fruits, biscuits, outside food etc. Majority of mother recommended animal milk (35/59) as an alternate food (Table I-32).

Table I-32: Knowledge and Perceptions of Mothers on Responsive feeding Practices

Indicators	% (N)
How old must be a child before he/she can eat by him/herself? (0-12 months)	**N=346**
– 6-11 mo.	3.8 (13)
– 12-23 mo.	24.3 (84)
Appropriate Responses	
– 24-35 mo.	22.8 (79)
– 36 mo.	13.3 (46)
Should mothers/caregivers sit and monitor how the child eats?	**N=575**
– Appropriate Responses "Yes"	83.0 (477)

***Note**: Only major reasons listed and multiple responses possible*

Hand-washing by Children before Eating

The Guiding Principles for Complementary Feeding of the Breastfed Child recommends (WHO/PAHO 2003);

- Practice good hygiene and proper food handling.

Only 82.4% mothers reported that they ensured hands washing by their child before eating, and only 33.5% washed their hands using soap and water.

Amount of Complementary Food

The Guiding Principles for Complementary Feeding of the Breastfed Child recommends (WHO/PAHO 2003);

- Start at 6 months with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding.

The energy needs from CF for infants with "average" breast milk intake in developing countries (WHO/UNICEF 1998) are approximately 200 kcal per day at 6-8 months, 300 kcal per day at 9-11 months, and 550 kcal per day at 12-23 months of age. In practice, caregivers will not know the precise amount of breast milk consumed, nor will they be measuring the energy content of CF to be offered. Thus, the amount of

food to be offered should be based on the principles of responsive feeding, while ensuring that energy density and meal frequency are adequate to meet the child's needs .

The *MAMTA* card developed on IMNCI guidelines recommends 1 bowl ("*katori*") of 200 ml per serving, three times a day for 6-12 months and one and half bowl per serving, 5 times a day for 1 to 2 years old children, along with breastfeeding. It is expected that mothers start with 1-2 table spoon per serving and soon reach till 1 bowl per serving by the time child is 12 months old. Further, a child above 1 year should be given more than one bowl per serving.

However, as presented in Table I-33, the quantity of CF given to breastfed and non-breastfed children was very less as compared to the recommended intake, mostly not exceeding 50 ml to 80 ml per serving. Only 1.6% breastfed children (9-11 mo.) consumed the recommended 200 ml of CF per serving, whereas none of the children above 1 year consumed, as recommended, more than 200 ml per serving.

Table I-33: Quantity of Complementary Food per Serving Given to Children

Months	6-8 mo. % (N)	9-11 mo. % (N)	12-17 mo. % (N)	18-23 mo. % (N)
Breastfed (N)	**65**	**62**	**94**	**92**
– 1-2 tea spoon	43.1 (28)	25.8 (16)	19.1(18)	7.6 (7)
– ¼ Bowl (50 ml)	23.1 (15)	40.3 (25)	35.1(33)	25.0 (23)
– 1/3 Bowl (80 ml)	-	16.1 (10)	21.3(20)	33.7 (31)
– ½ Bowl (100 ml)	1.5 (1)	9.7 (6)	19.1(18)	23.9 (22)
– Full Bowl (200 ml)	-	1.6 (1)	3.2(3)	6.5 (6)
– Not yet started	32.3 (21)	6.5 (4)	2.1(2)	8.3 (3)
Non-breastfed (N)	**0**	**2**	**9**	**22**
– 1-2 tea spoon	-	50.0 (1)	11.1 (1)	
– ¼ Bowl (50 ml)	-	-	55.6 (5)	18.2 (4)
– 1/3 Bowl (80 ml)	-	-	22.2 (2)	31.8 (7)
– ½ Bowl (100 ml)	-	50.0 (1)	11.1 (1)	40.9 (9)
– Full Bowl (200 ml)	-	-	-	9.1 (2)

Food Consistency

The Guiding Principles for Complementary Feeding of the Breastfed Child recommends (WHO/PAHO 2003);

- Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities

Infants can eat pureed, mashed and semi-solid foods beginning at 6 months. By 8 months most infants can also eat "finger foods" (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family.

The knowledge and perceptions of mothers of children under 6 months was assessed, regarding the suitable consistency of food, to be introduced on completion of 6 months (Table I-34). Most of the mothers recommended very thin liquid like consistency, which may not be appropriate. Only 5.7% mothers recommended thick food and 19.6% mothers recommended solid foods mainly biscuits.

Table I-34: Knowledge and Perception's of Mothers about Consistency of Complementary Food

Knowledge and Perceptions of Mothers of Children Under 6 months*	% (N=230)
– Very thin (liquid)	43.9 (101)
– Medium (thick but flows from spoon)	21.3 (49)
– Thick (falls as lump from spoon)	5.7 (13)
– Solid food	19.6 (45)
– No response	3.5 (8)
– Don't know/Not sure	3.9 (9)

***Note**: Percentage may not sum to hundred due to missing values*

On assessing the actual consistency of CF given to children, it was noted that, at around 6-8 months (Table I-35), majority of the children (30.8%) were yet not receiving any CF, whereas among children 9-23 months, 19.8% were still giving liquid or non solid foods and 3.1% had not yet started receiving any CF. Thus, overall the consistency of food given to children was only appropriate for 40% (26.2% + 13.8%) children 6-8 months and 74.3% children 9-23 months respectively.

Table I-35: Consistency of Complementary Food Given to Children

Complementary Food Consistency	Total % (N=346)	6-8 mo. % (N=65)	9-23 mo. % (N=288)
– Very thin (liquid)	5.2 (18)	12.3 (8)	2.8 (8)
– Medium (thick but flows from spoon)	6.9 (24)	16.9 (11)	5.6 (16)
– Thick (falls as lump from spoon)	15.6 (54)	13.8 (9)	14.2 (41)
– Solid food	63.9 (221)	26.2 (17)	74.3 (214)
– Not yet started	8.4 (29)	30.8 (20)	3.1 (9)

Meal Frequency and Energy Density

The *MAMTA* card recommends feeding children 7-11 months 1 bowl three times a day and children 12-23 months with one and half bowl five times a day. As shown in Table I-36, only 29.8% mothers recommended feeding a child 7-11 months three times a day, whereas, as few as, 12.1% mothers recommended feeding children above 12 months five times a day (Table I-36).

Table I-36: Knowledge of Mothers (Children below 1 year) about Complementary Feeding Frequency

Complementary Feeding Frequency	% (N=346)	
	7-11 months	12-23 months
– 2 times	19.9 (69)	7.2 (25)
– 3 times	29.8 (103)	14.2 (49)
– 4 times	12.7 (44)	17.1 (59)
– 5 times	6.1 (21)	12.1 (42)

Note: The percent may not sum to hundred due to missing values

The Guiding Principles for Complementary Feeding of the Breastfed Child recommends (WHO/PAHO 2003);

- Increase the number of times that the child is fed complementary foods as he/she gets older.

The percentage of children who were fed with appropriate foods is calculated based on indicators for assessing IYCF practices (WHO 2008). This is based on the number of food groups and frequency of feeds for the children during the day preceding the survey. The results are shown separately for breastfed and non-breastfed children, because the recommended feeding practices are different for these two groups. The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Minimum dietary diversity** as the proportion of children 6–23 months of age who receive foods from 4 or more food groups the day preceding the survey (IYCF indicator 5).

The 7 foods groups used for calculation of this indicator are (WHO, 2010) grains, roots and tubers, Legumes and nuts, Dairy products (milk, yogurt, cheese), flesh foods (meat, fish, poultry and liver/organ meats), Eggs, Vitamin-A rich fruits and vegetables and other fruits and vegetables.

Consumption of any amount of food from each food group is sufficient to “count”, i.e., there is no minimum quantity, except if an item is only used as a condiment (WHO 1991). The cut-off of at least 4 of the above 7 food groups was selected because it is associated with better quality diets for both breastfed and non-breastfed children (AED 2007). Consumption of foods from at least 4 food groups on the previous day would mean that in most populations the child had a high likelihood of consuming at least one animal-source food and at least one fruit or vegetable that day, in addition to a staple food (grain, root or tubers).

However, the diversity scores for breastfed and non-breastfed children cannot be directly compared, because breast milk is not ‘counted’ in any of the above food

groups. Breast milk is not counted because the indicator is meant to reflect the quality of the CF in the diet. As a consequence, this indicator may show 'better' results for children who are not breastfed than those who are breastfed in populations where formula and/or milk are commonly given to non-breastfed children (WHO 2008). It is recommended that the indicator be further disaggregated and reported for the following age groups: 6-11 months, 12-17 months and 18-23 months.

As presented in Table I-37, only 25.4% children above 6 months consumed food from at least 4 food groups listed above. On an average most of the children consumed around 2 food groups in 24 hours preceding survey, which was less than the minimum dietary diversity required for children 6-23 months.

Among the breastfed children, only 23.9% consumed at least 4 food groups in 24 hours preceding survey. As presented in Table I-37, the dietary diversity was better as the age advanced.

Among the non-breastfed children, the dietary diversity was very poor among the younger children between 6-11 months and 12-17 months, whereas, 63% children 18-23 months consumed at least 4 food groups. Further details about the types of food consumed are discussed later in the chapter.

Table I-37: Minimum Dietary Diversity

Minimum Dietary Diversity	% (N)	Mean ± SD	Median	Minimum, Maximum
Total (N=346)	25.4 (88)	2.5± 1.47	2	0,6
Breastfed (N=288)	23.9 (67)	2.6±1.30	2	0,6
– 6 to11 mo. (N=103)	16.5(17)	2.2±1.25	2	0,5
– 12 to 17 mo. (N=92)	22.8 (21)	2.7±1.17	3	0,5
– 18 to 23 mo. (N=85)	34.1 (29)	3.0±1.40	3	0,6
Non-breastfed (N=39)	53.8 (21)	3.5±1.23	4	1,6
– 6 to11 mo. (N=2)	0 (0)	1.5±0.71	2	1,2
– 12 to 17 mo. (N=10)	10 (1)	3.0±1.25	3	1,5
– 18 to 23 mo. (N=27)	63.0 (17)	3.8±1.08	4	1,6

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Minimum meal frequency** as the proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (including milk feeds for non-breastfed children) the minimum number of times or more (IYCF indicator 6). Minimum is defined as:

— 2 times for breastfed infants 6–8 months

— 3 times for breastfed children 9–23 months

— 4 times for non-breastfed children 6–23 months

"Meals" include both meals and snacks (other than trivial amounts), and frequency is based on caregiver report (WHO 2008)

This indicator is intended as a proxy for energy intake from foods other than breast milk[7]. Feeding frequency for breastfed children includes only non-liquid feeds and reflects the guiding principles[8] (WHO/PAHO 2003). Feeding frequency for non-breastfed children includes both milk feeds and solid/semi-solid feeds, and also reflects the guiding principles for these children (WHO 2005). It is recommended that the indicator be further disaggregated and reported for the following age groups: 6-11 months, 12-17 months and 18-23 months of age. The results may also be reported separately for breastfed and non-breastfed children.

Overall only 55.7% children (above 6 months) were fed as per the recommended norms of minimum feeding frequency. Among the breastfed children the meal frequency did not improve with advance in age, as a result minimum meal frequency reduced from 67% (6-8 mo.) to 58% (9-23 mo.). Among the non-breastfed children less than two-third children were being fed at least four times as recommended (Table I-38).

Table I-38: Minimum Meal Frequency

Indicator	Meal Frequency	N	Frequency	%
Breastfed				
– 6-8 mo.	>=2 times	45	30	66.7
– 9-23 mo.	>=3 times	232	134	57.8
Non-breastfed				
– 6-23 mo.	>=4 times	39	12	30.8
Minimum Meal frequency	**Total**	**316**	**176**	**55.7**

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Minimum acceptable diet** as the proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk) (IYCF indicator 7).

Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day

---

Breastfed children 6–23 months of age

and

Non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum dietary diversity not including milk feeds and the

[7] True energy intake is impossible to capture in simple surveys.

[8] Milk feeds are not included for breastfed children because the minimum meal frequencies in this indicator assume average breast milk intake, and if a substantial amount of energy from other milk is consumed, breast milk intake is likely to be considerably lower than average. Nevertheless, the actual intake of breastfed children who also receive milk feeds may be more than what is captured by this indicator.

minimum meal frequency during the previous day

Non-breastfed children 6–23 months of age

The 7 food group score is used for breastfed children**.** The 6 food group score, which excludes dairy products, is used for non-breastfed children. This is because milk feeds are considered separately and required element for non-breastfed children in this multi-dimensional indicator. Exclusion of milk feeds from the diversity score here avoids "double-counting" of this food group and allows use of this indicator in comparisons – across space and time – between populations with different rates of continued breastfeeding (WHO 2010). The rationale for at least 2 milk feedings for non-breastfed children is explained later in the section.

Overall, as presented in Table I-39 the minimum acceptable diet for children (6-23 mo.) was very poor, with only 15.8% children having received the minimum acceptable diet in 24 hours preceding the survey.

Table I-39: Minimum Acceptable Diet

Categories	Indicators	N	Frequency	%
Breastfed				
– 6-8 mo.	FG>=4 and >=2 time MMF	45	4	8.9
– 9-23 mo.	FG>=4 and >=3 times MMF	232	45	19.4
Non-breastfed				
– 6 -23 mo.	FG>=4 and >=2 FG** milk and >=4 times MMF	39	1	2.6
Minimum Acceptable Diet		**316**	50	15.8

FG= Food Group and MMF= Minimum Meal Frequency

*** Due to non-availability of data on frequency of milk feed in place of 2 times milk feeding 2 milk food item were consider, with an assumption that most children consumed each milk food item mostly once.*

The WHO 2010, indicator for assessing IYCF practices defines;

- ✓ **Milk feeding frequency for non-breastfed children** as the proportion of non-breastfed children 6-23 months of age who receive at least 2 milk feedings day preceding the survey (IYCF indicator 15).

Milk feedings include liquid milk products such as infant formula, cow milk or other animal milk. The specific products to be included need to be defined for each target population, to take into account local milk products that are commonly fed to young children in substantial quantities e.g. fermented dairy products (WHO 2008).

The minimum of 2 milk feedings was selected based on the following: the average energy intake from breast milk in developing countries is approximately 400 kcal per day among children 6-11 months of age and 350 kcal per day among children 12-23 months of age (WHO/PAHO 2003). For non-breastfed children, the dietary analysis

results (AED, 2007) indicated that 3 milk feedings per day would generally allow for an average intake of milk that is similar to this range (300–400 kcal from milk). Most children will probably not consume more than 180–240 ml of milk per feed, which would be equivalent to 100–150 kcal/feed if consumed as liquid whole cow milk. Taking the upper end of this range (150 kcal /f eed) and a slightly lower "target" for energy intake from milk than is consumed by breastfed children (300 kcal/day) a minimum of 2 milk feedings per day would be needed (WHO 2008).

In the current study, due to non-availability of data on frequency of milk feed, the numbers of milk items consumed were considered, since each milk food item would be consumed at least once. Among the non-breastfed children, 71.8% (28/39) consumed more than one milk item, and only 20.5% (8/39) consumed at least 2 milk items in 24 hours preceding the survey.

Type of Complementary Foods

The guiding principles for complementary feeding, of the breastfed child recommends WHO/PAHO 2003);

- Feed a variety of nutrient-rich foods to ensure that all nutrient needs are met.
- Use fortified complementary foods or vitamin-mineral supplements for the infant, as needed

Table I-40, presents the consumption pattern of seven food groups, classified according to WHO norms for dietary diversity, among children aged 6-36 months on the day preceding the survey (WHO 2008). Further, the consumption pattern of breastfed and non-breastfed children is also presented in the same table. A 24 hour food frequency recall method was used for assessing the consumption pattern.

Overall 80.9% children were breastfed in the 24 hours preceding the survey. The consumption pattern of foods from the seven food groups was low, except for the consumption of cereal grains, roots and tubers (87%). Also, less than half of children were fed legumes and nuts, and over three-fourth were fed dairy products. The consumption of other fruits and vegetables was only 24%. Non vegetarian food and egg was consumed least.

When the data was analyzed separately for breastfed and non-breastfed children, as expected due to absence of breastfeeding, the non-breastfed children had better frequency in consumption of all food groups as compared to breastfed children. Among all foods groups, the frequency of consumption of grains, roots and tubers was highest among breastfed (69.5%) and non-breastfed children (94.9%), within their groups respectively. The frequency of consumption of dairy products (71.8%)

was little better than legumes and nuts (69.2%), among the non-breastfed children, which was not so for breastfed children.

Table I-41 presents the consumption pattern of individual foods and liquids items consumed by the children 24 hours preceding the survey. The most commonly consumed food items were cereal based (mainly wheat or bajra based) '*roti'* (65.9%), followed by biscuits (60.4%), rice (50%), cereal pulse mix '*Kichadi'* (47.7%) and ICDS ready-to-eat '*Balbhog*- energy dense micronutrient fortified extruded blended food*'* (32.7%). The other commonly given food items included '*dal'* (35.8%), animal milk (32.4%) and yellow or orange fruits (32.4%). Other than yellow or orange fruits and vegetables, the consumption of other Vitamin-A rich foods like GLVs was least.

The consumption pattern of all major food items was better among non-breastfed as compared to breastfed, except from '*Balbhog'* and biscuits which was surprisingly consumed more by breastfed children as compared to non-breastfed.

The children were also offered packaged food as snacks such as rice based fryums like '*kurkure'* and local items called '*testi' 'bhungada'*; potato chips, as well as, biscuits.

Table I-40: Consumption Pattern of Various Food Groups the Day Preceding the Survey (Children 6-36 months)

Foods Groups Consumed Previous Day	All % (N=346)	Breastfed % (N=280)	Non-breastfed % (N=39)
Breastfeeding status			
– Breastfed	80.9 (280)	-	-
– Non-breastfed	11.3 (39)	-	-
– Don't know	7.8 (27)	-	-
1. Grains, roots and tubers	87.0 (301)	69.5 (264)	94.9 (37)
2. Legumes and nuts	49.7(172)	38.2 (145)	69.2 (27)
3. Dairy products (milk, yogurt, cheese)	40.2 (139)	29.2 (111)	71.8 (28)
4. Flesh foods (meat, fish, poultry and liver/organ meats)	0.9 (3)	0.3 (1)	5.1 (2)
5. Eggs	1.7 (6)	1.8 (5)	2.6 (1)
6. Vitamin-A rich fruits and vegetables	40.5 (140)	41.1 (115)	64.1 (25)
7. Other fruits and vegetables	24.0 (83)	18.4 (70)	33.3 (13)

Table I-41: Consumption Pattern of Various Food and Liquids among Children 6-36 months on the Day Preceding the Survey

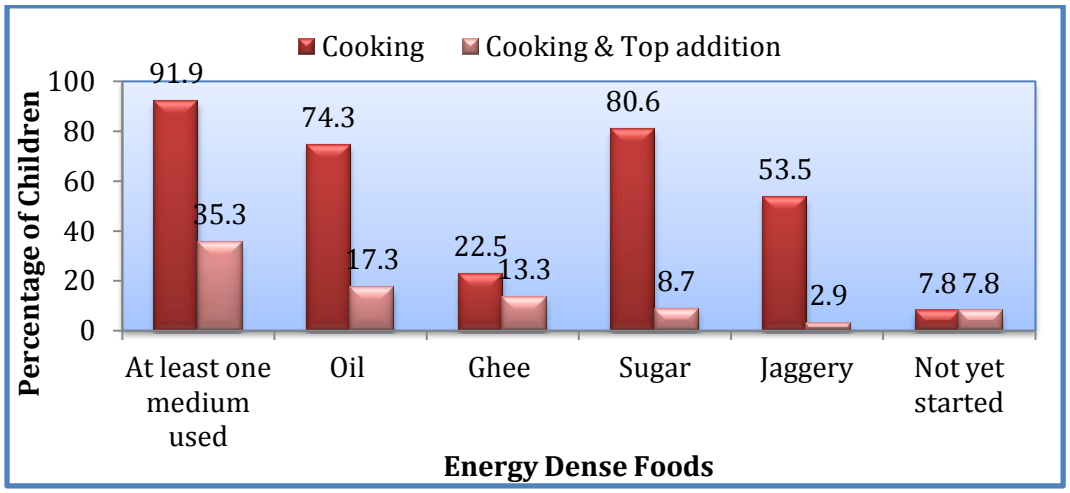
Foods Groups Consumed Previous Day	All % (N=346)*	Breastfed % (N=280)	Non Breastfed % (N=39)
Grains, Roots and Tubers	**87.0 (301)**	**69.5 (264)**	**94.9 (37)**
1. Roti, pratha, puri, bhakri etc	65.9 (228)	71.1 (199)	74.4 (29)
2. Rab	18.2 (63)	20.4 (57)	15.4 (6)
3. Nuts and oil seeds	12.4 (43)	13.2 (37)	15.4 (6)
4. Rice	50.0 (173)	52.9 (148)	64.1 (25)
5. Fortified *Balbhog*	32.7 (113)	36.1 (101)	30.8 (12)
6. *Anganwadi* food/snacks, specify	6.9 (24)	6.8 (19)	12.8 (5)
7. Khichadi/daliya	47.7 (165)	49.3 (138)	69.2 (27)
8. Sweet like *kheer, halva, sera* etc. (also contains some milk and pulses)	15.0 (52)	15.4 (43)	23.1 (9)
9. Biscuits	60.4 (209)	65.7 (184)	64.1 (25)
10. Rice Based Snacks			
1. Bhungada	15.6(54)	16.1 (45)	23.1 (9)
2. Papadi	10.1(35)	10.4 (29)	15.4 (6)
3. Mumra	9.0(31)	8.9 (25)	15.4 (6)
4. Testi	1.7(6)	2.1 (6)	-
5. Pava	1.2(4)	1.4 (4)	-
11. Wheat Based Snacks (Toast)	0.6(2)	0.7 (2)	-
12. Wafer (potato based snack)	13.6(47)	15.0 (42)	12.8 (5)
Legumes and Nuts	**49.7(172)**	**38.2 (145)**	**69.2 (27)**
1. Roots and tubers	22.0 (76)	21.8 (61)	38.5 (15)
2. Dal	35.8 (124)	36.1 (101)	59.0 (23)
3. Dal water	2.9 (10)	3.6 (10)	
4. Kadhi	2.9 (10)	2.9 (8)	5.1 (2)
5. Legumes based Snacks	8.1(28)	7.1 (20)	20.5 (8)
Dairy Products (Milk, Yogurt, Cheese)	**40.2 (139)**	**29.2 (111)**	**71.8 (28)**
1. Animal milk	32.4 (112)	31.1 (87)	64.1 (25)
2. Milk preparation like curd, *panner*	3.8 (13)	3.9 (11)	5.1 (2)
3. Tea	3.8 (13)	3.9 (11)	5.1 (2)
4. Bournvita/horlicks	0.9 (3)	0.7 (2)	2.6 (1)
5. Ice cream/ Kulfi (milk based)	1.4 (5)	0.7 (2)	7.7 (3)
6. Quality ice candy (waster based)	2.0 (7)	2.5 (7)	-
7. Almond shake	0.3(1)	0.4 (1)	-
Flesh Foods (Meat, Fish, Poultry and Liver/Organ Meats)	**0.9 (3)**	**0.3 (1)**	**5.1 (2)**
Eggs	**1.7 (6)**	**1.8 (5)**	**2.6 (1)**
Vitamin-A Rich Fruits and Vegetables	**40.5 (140)**	**41.1 (115)**	**64.1 (25)**
1. GLVs	1.7 (6)	1.1 (3)	7.7 (3)
2. Yellow or orange vegetables	12.7 (44)	13.9 (39)	12.8 (5)

Foods Groups Consumed Previous Day	All % (N=346)*	Breastfed % (N=280)	Non Breastfed % (N=39)
3. Yellow or orange fruits	32.4 (112)	32.9 (92)	51.3 (20)
Other Fruits and Vegetables	**24.0 (83)**	**18.4 (70)**	**33.3 (13)**
1. Other fruits	15.3(53)	15.7(44)	23.1(9)
2. Fruit juice	2.9(10)	2.9(8)	5.1(2)
3. Other vegetables	12.1(42)	11.8 (33)	23.1(9)

** All children 6-23 mo.included irrespective of breastfeeding status including, those whose breastfeeding status is not know included. For items with multiple ingredient (more than 1 major ingredient) categories based on the main ingredient.*

For enhancing the energy density of CF, top addition of energy dense food like oil, ghee, sugar and jaggery is recommended. As presented in the Figure I-3, among children 6-23 months, the most common energy dense item used in cooking was sugar (80.6%) and oil (74.3%). The least used energy dense item in cooking was ghee (22.5%). The top addition of these items for enhancing the energy density of CF was practiced for only 35.3% children 6-23 months of age (Figure I-3).

Figure I-3: Consumption of Energy Dense Foods (6-23 months), N=346



The WHO 2010 indicator for assessing IYCF practices defines;

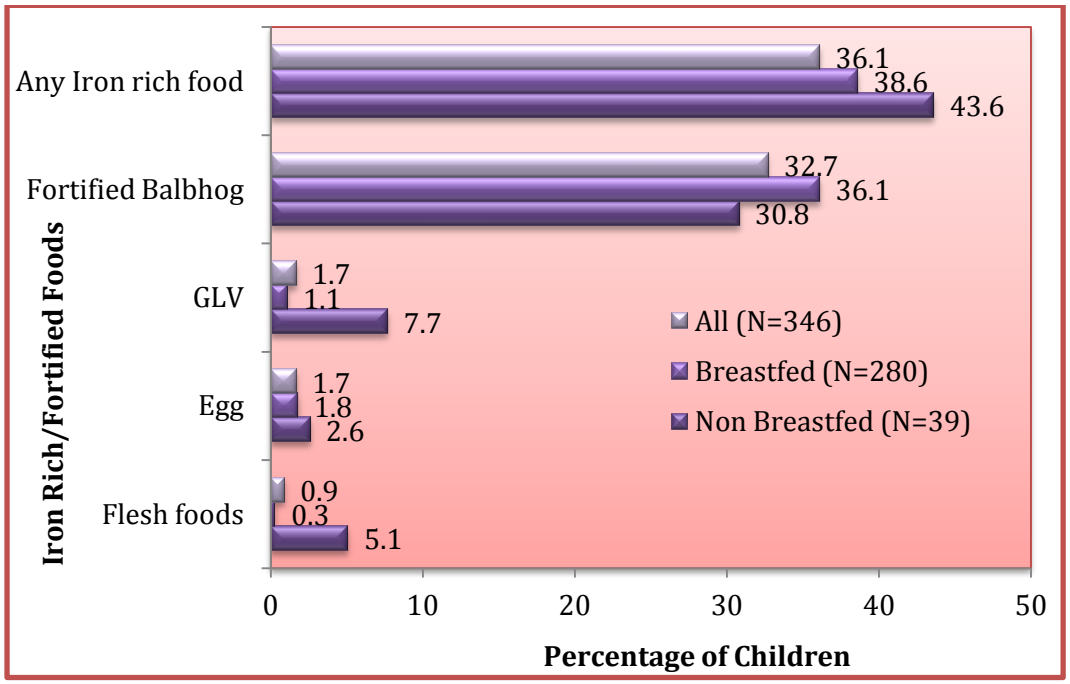
- ✓ **Consumption of iron-rich or iron-fortified foods** as "the proportion of children 6–23 months of age who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home" (IYCF indicator 8).

Overall, the consumption of iron-rich foods, excluding any supplement was around 36.1% (Figure I-4). The consumption of iron-rich food was better among non-breastfed (43.9%) as compared to breastfed children (38.6%). Among all iron-rich foods the major source was ICDS fortified *Balbhog* (32.7%). The awareness and

utilization of *Balbhog* plays an important role in enhancing CF practices, this is discussed later in the section on *Balbhog.*

The National Anemia Control Program recommends supplementation of 100 Iron Folic Acid (IFA) tablets every year for all children 6-60 months. On assessing the consumption of IFA supplements, it was noted that, receipt of IFA supplement at least once, was reported for only 7% children 6-23 months.

Figure I-4: Consumption of iron-rich or iron-fortified foods in 24 hours preceding the Survey



Feeding During and After Illness

The Guiding Principles for Complementary Feeding of the Breastfed Child recommends (WHO/PAHO 2003);

- Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, favorite foods.
- After illness, give food more often than usual and encourage the child to eat more

The knowledge and perceptions assessment of mothers showed that, only 24.5% (140/572) mother's recommended increasing number of meals and/or quantity of food.

On assessing the breastfeeding practices of mother's during diarrhea, one of the most common illnesses, it was found that 14.4% (83/575) mother's reported the index child to have had diarrhea within 15 days preceding the survey. Of the 83

children suffering from diarrhea only 83.1% (69/83) were breastfed during diarrhea, 3.6% (3/83) were not breastfed during diarrhea and 7.2% (6/83) were already not on breastfeeding.

Discussion - Infant and Young Child Feeding Practices

The following section discusses the knowledge, perceptions and practices of mothers of children below 2 years and pregnant women's regarding the IYCF practices.

The IYCF practices are discussed mainly with reference to the 15 core indicators, introduced by WHO for assessing IYCF practices by large-scale surveys (WHO 2008, WHO 2010).Since the IYCF indicators were introduced in 2008 and its subsequent Part-II guide on measurement which provides tools for collection and calculation of the indicators in 2010, there are studies presented in the discussion, which may not have assessed the IYCF indicators with similar criteria.

Additionally in the current discussion, the complementary feeding (CF) practices are also discussed in light of the recommendations from the Guiding Principles for Complementary Feeding of the Breastfed Child (WHO/PAHO 2003).

Breastfeeding

a) *Knowledge and Perceptions of Breastfeeding Practices*

Even though it is a natural act, breastfeeding is also a learned behaviour. Virtually all mothers can breastfed provided they have accurate information, and support within their families and communities as well as from the health care system. They should also have access to skilled practical help, for example, from trained health workers, lay and peer counsellors, and certified lactation consultants, who can help mothers' to build confidence, improve feeding technique, and prevent or resolve breastfeeding problems (WHO 2002).

In the current study, the knowledge and perceptions of pregnant and lactating mothers, related to optimal breastfeeding practices, was around 40-45% respectively. Sethi *et al.* in 2003 concluded that ignorance and blindly following generation old beliefs emerged as barriers to appropriate infant feeding practices, in a relocated slum of Delhi. The knowledge of the mothers regarding the time of initiation of Breastfeeding and CF, types and frequency of CF to be fed was poor (Sethi *et al.* 2003). A study by Daxini and Kanani (2009), in rural Vadodara district reported that only few mothers (<50%) had correct information related to majority of IYCF practices. In the same year (2009), a study in Haryana concluded that the overall

knowledge of mothers (children below 6 mo.) on EBF and breastfeeding was suboptimal (Kishore *et al.* 2009).

Early Breastfeeding Practices

In the current study only 39% pregnant women knew about EIBF, 40% knew about feeding colostrum to the new born and as low as 20% were aware that prelacteals should not be given to the baby.

A study conducted by Ekambaram *et al.* in 2009 on 100 postnatal mothers, in a hospital in south India showed that 92% and 70% mothers knew the timing of initiation of breastfeeding after normal delivery and cesarean. Further, only 56% of the mothers knew that colostrum needs to be given and 74% were aware of not giving prelacteals to the babies (Ekambaram *et al.* 2010). In the study by Daxini and Kanani (2009) only 49.6% mothers, in rural Vadodara, believed that colostrum should be given and 25.2% believed that colostrum is good for the child. It is important to note that both these studies were conducted on postnatal mothers, as a result the knowledge and perceptions reported in both the studies were better as compared to, the pregnant women in the current study.

Exclusive Breastfeeding

Sharma and Kanani (2008) showed that, only 15% grandmother's believed in EBF children for around 3-6 months. Further, a study by Maheswari *et al.* (referred above) showed that only 38% of the mothers knew that EBF should be given for 6 months (Ekambaram *et al.* 2010). A cross-sectional survey carried out in Mangochi district (157 rural and 192 semi-urban mother-infant pairs) showed that the proportion of mothers who knew about EBF and those who reported to have actually EBF were 40.1% and 7.5% respectively (Kamudoni *et al.* 2010).

The present study showed better knowledge of mother as compared to the earlier studies. Around 23% pregnant woman and 44% lactating mothers were aware of the correct duration of EBF, which needs to be improved along with the actual EBF rates.

Continued Breastfeeding

A study conducted by Gupta and Sharma (2006) in Uttarakhand, showed that 67% of the mothers perceived the expected duration of continuation of breastfeeding for their children, to be 18-24 months whereas, 19% and 14% of the rest of the population responded it as for more than 24 months and less than 18 months.

Similarly in the current study, most of the pregnant and lactating women, 47% to 53% respectively, recommended continued breastfeeding for around 12-23 months, and

as little as, 13% and 17% respectively, were aware of continuing breastfeeding till 2 years.

Breastfeeding Frequency, Duration and Adequacy

The knowledge and perceptions of mothers' on breastfeeding frequency, duration and adequacy has been discussed with reference to the actual field studies, since study on knowledge and perceptions were not available, during literature search.

A study in urban health center of Delhi showed that, 67.3% mother's breastfed their children on demand; rest 32.7% breastfed their children according to a fixed schedule (Rasania *et al.* 2003). A cross-sectional study in semi-urban health care centers, of Pakistan (N=200) showed that, 43% woke up their infant to feed if time had exceeded 2 hours (Ali *et al.* 2011). The study conducted in rural Vadodara revealed that 74.4% mother's believed that the baby should be breastfed when it cries (Daxini and Kanani 2009).

The perceptions found in the present study differed from the practices reported in the studies mentioned above. In the present study, less than half of the pregnant women recommended breastfeeding on a time schedule (46.3%) and on demand (42.6%). Contrary to this, among the lactating mothers, 71.9% recommended feeding on a time schedule and only 25.6% recommended feeding on demand.

Only 25% pregnant and lactating women had correct knowledge and perceptions about the minimum frequency and duration of breastfeeding. Also, around 30% pregnant and lactating women perceived that, child should be breastfed for around 5 to 10 minutes only. However, the perceptions of pregnant and lactating women on use of both breasts during each feed (85% and 90%) and use of alternate breast (69% and 79%) during every new feed was satisfactory.

No study was found, which investigated the perceptions of mothers in the same way. A similar nationwide study by BPNI (98 blocks, 49 districts) showed that majority of women (96.7%) breastfed more than 5 times during the day, and almost all breastfed the child during night (Gupta and Sharma 2004).

Lastly in the current study, almost all pregnant and lactating women did not project correct knowledge on deciding whether her milk was adequate for the baby. Majority of the mothers related crying (24.1%) as an indicator of *"Not Enough Breast Milk"*. Aggarwal *et al.* (1998) reported even higher percent of mothers (49.4%) who perceived breast milk insufficiency often based on crying of the infant. The same study also showed that crying of the infant was the most commonly cited reason for supplementing breast milk, before 4 months of age, among low-income urban women

in Delhi.

Benefits of Breastfeeding

Not many mothers, in the present study, were aware of the benefits of breastfeeding. Around 25% pregnant and lactating mothers were aware that breastfeeding enhances baby's immunity, whereas, 14% lactating mothers perceived breast milk as good for the baby.

Another similar study on rural population of north India showed that about 47.2% of the respondents were not aware of the benefits of EBF (Mohmood *et al.* 2012). Contrary to the current finding, Ali *et al.* (2011) showed that in Pakistan majority of the females were aware of the advantages (92%) and the disadvantages (85%) of breastfeeding, however, the awareness of positive feedback relationship of milk production and suckling was lacking and breastfeeding was considered to cause weakness in mothers.

b) *Counseling on Breastfeeding Practices*

A study in a hospital in Pondicherry, on 108 primigravida mothers (>=3 ANC visit) showed that the existing antenatal counseling on breastfeeding is inadequate in the population studied, and needs to be strengthened. Informing all pregnant women about the benefits and management of breastfeeding should be a priority during antenatal visits (Gunasekaran *et al.* 2008).

ANC Checkup and Breastfeeding Counseling

In the current study area, 97.7% lactating mothers had at least one ANC checkup and 71% had received breastfeeding counselling during the last pregnancy. The association between ANC checkup visits and breastfeeding counseling was statistically significant ($p<0.01$) among those mothers who had more than 3 ANC visits.

A cross-sectional study in Karnataka (N=126 caregivers), showed that ANC a crucial time for dietary education was not used efficiently. Although all the mothers received ANC, over half 55% of them did not receive help with breastfeeding. The rest were taught about EBF till 6 months, which was not followed. Very few mentioned that the position and attachment of the baby for breastfeeding were discussed (Benakappa and Shivamurthy 2012).

Sources of Counseling and Key Messages on Breastfeeding

A Community based study in (N=408, 1-3 years) Rohtak district, in 2005 showed that

advice regarding breastfeeding and CF was given by AWWs to 43.8% women (Prinja *et al.* 2008). However, not many studies reported such findings. Daxini and Kanani (2009) reported that, in rural Vadodara, the mothers' practices were influenced to a great extent by their own experiences and by knowledge obtained from people within and outside the family. Very few mothers mentioned doctors, ANMs and AWWs as their source of knowledge for IYCF practices, depicting negligible role of the functionaries in influencing IYCF practices.

The status of counselling by AWWs in the present study was poor. Even though around 50% pregnant mother's and 70% lactating women were counseled on early and optimal breastfeeding practices during *MAMTA DAY*, pregnancy and postnatal; the counseling by AWWs in particular ranged from as low as 8% (expression of breast milk) to 12% (breastfeeding attachment, positioning) postnatal to around 10% (no prelacteals) to 15% (EIBF) during pregnancy and *MAMTA DAY*.

c) *Children Ever Breastfed*

Comparing the ever breastfeeding rates of current study with NFHS-3 it is clear, from Table I-42, that the status of breastfeeding has improved over the years, especially the ever breastfed and predominant breastfeeding rates. The only point of concern was the drop in age appropriate breastfeeding rates among children below 2 years, in the current study as compared to NFHS-3 (NFHS-3 2007 and NFHS-3 Gujarat 2008).

Various studies conducted in India have reported similar rates for children ever breastfed, in rural central Karnataka 97% (Banapurmath *et al.* 1996) and rural Uttarakhand 93.6% (Vyas *et al.* 2012).

The only study available which analyzed the breastfeeding indicators using WHO 2010 indicator for assessing IYCF practices, was the one conducted by Hanif in 2011. The study analyzed the data in light of the Pakistan Demographic and Health Surveys (1990-91 and 2006-07) and several other national studies conducted since 1995. The analysis showed that the proportion who was *ever breastfed* was 96% in 2005-06 (Mahmud *et al.* 2007a), and remained stable till 2007-08 (Mahmud *et al.* 2007b). The proportion of infants *predominantly breastfed* was 18.8% in 2006-07, whereas, the duration of predominate and/full breastfeeding was 4.9-5.6 months respectively in 1990-91 (DHS 1992, DHS 2008). The *mean duration of any breastfeeding* decreased from 19.8-18.3 mo, between 1990-91 and 2006-07 DHS (DHS 1992, DHS 2008), and, the prevalence of *age appropriate breastfeeding* did not change in period of approximately 15 years: 48.2% in 1990-91 and 46.2% in

2006-07 (DHS 1992, DHS 2008).A similar trend was also reported in the current study when compared with NFHS-3 results (Table I-42). Overall, the breastfeeding status based on the 4 indicators mentioned above was found to be tter in current survey and India as compared to Pakistan.

Table I-42: Status of Children Ever Breastfed

Core indicators	Baseline	NFHS-3			
		India	India - Rural	Gujarat	Gujarat-Rural
Children ever breastfed (%)	99.2	95.7	95.7	96.8	96.9
Predominant breastfeeding under 6 mo. (%/months)	84.1	88.7 /5.1 mo.	5.4 mo.	90.4 /5.2 mo.	5.6 mo.
Duration of breastfeeding (months)	>23	24.4	25.7	22.9	24.3
Age-appropriate breastfeeding %)	57.8	66.2	NA	64.3	NA

***Source**: NFHS-3 2007 and NFHS-3 Gujarat 2008*

***Note: Age-appropriate breastfeeding:** Calculated using NFHS-3 India and Gujarat report table on bf status by age. The rate was calculated using the number of children in each age group covered and % EBF (<6) and BF+CF in the age group of 6-9,9-11,12-23 mo. from the table. **Predominant breastfeeding:** Calculated using NFHS-3 India and Gujarat table on BF status by age. The percentage of children below 6 years being EBF or receiving BF including plain water, non-milk liquid juice or other milk item were added for this. Predominant BF was also calculated for DLHS-3 Gujarat using BF and weaning status table. In DLHS-3 data, the rate was calculated using the number of children in each age group covered (i.e. <2, 2-3, 4-5) and percent EBF and BF + receiving other fluids. Calculated from India and Gujarat, using NFHS-3 India and Gujarat report table on breastfeeding status by age.*

d) *Early Breastfeeding Practices*

The Government of India recommends that initiation of breastfeeding should begin immediately after child birth, preferably within one hour of birth (Ministry of Women and Child Development, 2006). EIBF is encouraged for a number of reasons, such as it stimulate breast milk production and facilitates the release of oxytocin, which helps the contraction of uterus and reduces postpartum blood loss. The first breast milk (colostrum) is highly nutritious and has antibodies that protect the newborn from diseases. Late initiation of breastfeeding not only deprives the child of valuable colostrum, but also becomes a reason for introduction of prelacteal feeds (that is, something other than breast milk) like glucose water, honey, ghutti, animal milk, or powdered milk that are potentially harmful and contribute to diarrhoea in the newborn (NFHS-3 2007). Some authors have reported that main reasons for difficulties in initiating breastfeeding were belief that mother's milk was not sufficient, excessive crying, little milk, thinned milk (Caldeira and Goulart 2000).

The NFHS-3 survey in 2005-06 revealed that only one-quarter 23.4% childen in India

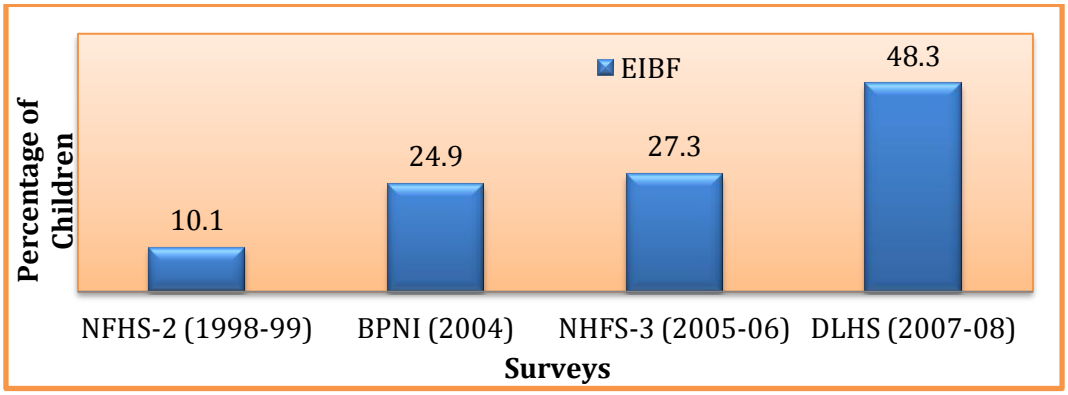
and 27.8% in Gujarat were put to the breast within the first hour of life. Almost half (45%) did not start breastfeeding within one day of birth in India. The EIBF rates were even lower for rural area, 22.4% (India rural) and 25.4% (Gujarat rural). Also there is considerable interstate variation, ranging from around 4% in Bihar and 7% in Uttar Pradesh to 66% in Mizoram. The majority of women in most states in the North East and West Regions, and in Tamil Nadu, Kerala, and Orissa begin breastfeeding their baby within one hour of birth (NFHS-3 2007). As presented in Table I-43, over the years a number of studies have reported the EIBF rates for different regions of India.

Table I-43: Trends in Early Initiation of Breastfeeding

Location	Prevalence (%)	Reference
Rural Central Karnataka	0.3	Banapurmath *et al.* 1996
Coal mine, AP	64	Ramkrishna 2000
Ghaziabad	63.9	Singh 2002
Uttarakhand	38	Gupta and Sharma 2006
Rural Vadodara	15	Daxini and Kanani 2009
India	24.5	NFHS-3 2007
Gujarat	27.8	
Urban Slum Baroda	17	Kanani and Mandali 2007
Gujarat	48.3	DLHS-3 2010
Vadodara district	57.9	
Urban slum, Lucknow	69.8	Gupta *et al.* 2010
Slums of Bhavnagar City	38.1	Raval *et al.* 2011
Rural Area - Uttarakhand	21.37	Vyas *et al.* 2012
East Delhi	37.2	Khan *et al.* 2012

However as presented in Figure I-5 the EIBF rate for Gujarat has increased from 10.1% (1998-99) to 48.3% by 2007-08 (NFHS-2 1999 and DLHS-3 2010).

Figure I-5 Early Initiation of Breastfeeding within One Hour of Birth - Gujarat



***Source**: NFHS-2 1999, Gupta and Gupta 2004, NFHS-3 2007, DLHS-3 2010*

Similar to Gujarat, over the years, the EIBF for Vadodara has also shown improvement, Daxini and Kanani (2009) reported the EIBF rates as low as 15% in rural Vadodara before the NFHS-3 survey, later on the DLHS-3 survey in 2007-08 reported the EIBF rate as 57.9% for Vadodara (DLHS-3 2010). The present study reported further rise in EIBF rate, with 73.4% of the infants delivered normally initiated breastfeeding within one hour and 54.8% delivered through C-section were initiated breastfeeding within four hours of birth.

The rise in EIBF rates has also led to decline in the practice of prelacteal feeding over the years. Mandal *et al.* (2007) mentioned that giving prelacteal feed is a deep-rooted custom in India, as is evident in a plethora of studies; unfortunately, the mothers are not aware that the prelacteal feeds could be a source of contamination. Further studies have also reported that prelacteal feeds are given because it is believed that they act as laxatives or as a mean of clearing the meconium (Chaturvedi *et al.* 2007, Sharma and Sharma 2005 and Pathi and Das 2005). As presented in Table I-44, feeding prelacteals like boiled water, sugar/honey/jaggery water and glucose is widely prevalent in urban, as well as rural India, ranging from 86% in Orissa, 65% in Rajasthan, to 61.5% slums of Bhavnagar city (Pathi and Das 2005, Parmar *et al.* 2000 and Raval *et al.* 2011).

Table I-44: Trends in Prelacteals Feeding

Location	Prevalence (%)	Reference
Rural Central Karnataka	100	Banapurmath *et al.* 1996
Chandigarh	42	Parmar *et al.* 2000
Orissa	86	Pathi and Das 2005
Rural Gujarat	59	NFHS-3 Gujarat 2008
Urban Slums of Baroda	44.7	Sharma and Madali 2007
Gujarat	57.3	NFHS-3 2007
India	57.2	NFHS-3 2007
Aligarh, urban area	45.7	Khan *et al.* 2009
Vadodara	40 -73	Daxini and Kanani 2009; Srivastava and Sandhu 2005; Sharma and Mishra 2004; Kanani and Gadre 2003 and Kanani and Malik 2002
Rural India	27	Deshpande *et al.* 2010
Bhavnagar Slums	61.5	Raval *et al.* 2011
Rural North India (Bhojipura block, Bareli, UP)	22.8	Mahmood *et al.* 2012
Rural Area - Uttarakhand	66.03	Shaili *et al.* 2012

The NFHS-3 (2005-06) survey showed that around 57% mothers gave prelacteal feed, with an interstate variation ranging from 91% in Bihar to 11% in Kerala and 12% in Sikkim (NFHS-3 2007). The prelacteal feeding rate in Gujarat was also higher (57.3%), and, the rate was even higher in rural 58.6% as compared to urban 55.3% (NFHS-3 Gujarat 2008).

The studies conducted in Vadodara district (urban and rural), primarily before NFHS-3 (2005-06), have reported the practice of prelacteal feeding ranging from 40 -73%. These studies reported the newborns being given prelacteals, mainly ''*Patasa water" or* honey. The main reasons given were; initially no breast milk is produced and child is hungry (Daxini and Kanani 2009; Srivastava and Sandhu 2005; Sharma and Mishra 2004; Kanani and Gadre 2003 and Kanani and Malik 2002).

In the current study, 36.5% mothers confirmed having given prelacteals to the child immediately after birth. The most commonly given prelacteals were '*Patasa water'* or *Jaggery*. This was little less than the rates reported in earlier studies, being conducted in Vadodara.

With reference to colostrum feeding, Singh and Srivastava (1992) showed that colostrum feeding makes a larger contribution to survival; neonatal and post-neonatal deaths are around 5-6 times lower in infants fed colostrum than among those not fed colostrum.

Table I-45, shows a wide variation in rates of colostrum feeding within and across districts, states as well as rural, urban and tribal area. In early 2000, studies in urban and rural Vadodara have reported colostrum feeding rate as around 61% to 64%. The reasons reported for not feeding colostrum were 'it is stale/dirty' (Srivastava and Sandhu 2005, Mehan and Yadav 2004, Kanani and Gadre 2003).

Improvement in colostrum feeding rates (71%) were reported in 2006 by Kanani and Katwala in urban Vadodara, however, a study in rural Vadodara showed colostrum feeding rates as 49.6% only. Those who discarded colostrum stated reasons such as; 'colostrum is unhealthy for the child' and it was 'dirty and stale milk' (Daxini and Kanani 2009). The DLHS-3 survey showed that in Gujarat 66% and in Vadodara 77.9% children were fed with colostrum. However, there was visible variation across districts with at least 85% of children being fed with colostrum in the districts of Surat, the Dangs, Panchmahals, Porbandar, and Jamnagar, while in the other districts it is in the range of 60% to 84% (DLHS–3 2010).

The present study found that around 60% neonates were fed colostrum, and, around 29% mothers reported having discarded only first few drops of colostrum owing to family rituals and false beliefs. Thus, overall the colostrum feeding practice in the

current study area was found better as compared to the earlier studies in Vadodara, also, colostrum feeding practice reported in the current study is almost similar to the recent DLHS-3 Gujarat survey.

Table I-45: Trends in Colostrum feeding

Location	Prevalence (%)	Reference
Central Karnataka	71.4	Banapurmath *et al.* 1996
Chandigarh	80	Parmar *et al.* 2000
Bhil tribe, Jhalva District, MP	22.7	Taja *et al.* 2001
Rural community of Ghaziabad	47.8	Singh 2002
Bihar	65.7	Yadav and Singh 2004
Rural and Urban Vadodara	61-64	Srivastava and Sandhu 2005, Mehan and Yadav 2004 , Kanani and Gadre 2003
Urban Vadodara	71	Kanani and Katwala 2006
Urban Slum of Vadodara	54.3	Sharma and Mandlik 2007
Rural Vadodara	49.6	Daxini and Kanani 2009
Gujarat	76.2	DLHS–3 2010
Gujarat Rural	74.5	DLHS–3 2010
Vadodara district	77.9	DLHS–3 2010
Urban slum, Lucknow	43.5	Gupta *et al.* 2010
Urban slum Bhavnagar in 2009	36.9	Raval *et al.* 2011
Rural Area - Uttarakhand	87.1	Vyas *et al.* 2012
Rural North India (Bhojipura block, Bareli, UP)	84.6	Mahmood *et al.* 2012

In the current study around 47% mother's breastfed a minimum 8 to 12 times in 24 hours preceding the survey, indicating that less than 50% mothers were following the correct feeding practices. The average number of feeds given by mother preceding the survey was 10 feeds. This was comparatively less than the one reported by NFHS-3. The NFHS-3 survey showed that on average women in India and Gujarat fed 12 times during the day and night before the survey.

e) *Practice of Exclusive Breastfeeding and Continued Breastfeeding*

The Government of India Guidelines recommends that children should be EBF for the first 6 months of life (that is, the child should be given only breast milk and nothing else, not even water) and that children should be given appropriate and adequate CF in addition to continued breastfeeding from 6 months (GOI 2006 and Tiwari *et al.* 2010).

Exclusive Breastfeeding

The following discussion covers only those studies which follow the WHO 2010 definition of EBF, stated earlier in this section.

In last 90's a study on 1050 infants (0-24 mo.) in village of central rural Karnataka showed that the EBF was 26.8% at 6 months of age (Banapurmath *et al.* 1996). Studies on breastfeeding patterns in an urban resettlement colony of Delhi, (N=650, 0 to 12 mo.), showed that breastfeeding was maintained at a high level (>90%) throughout infancy while EBF showed a rapid decline. At 1 month 74% and at 4 months 46% of infants were EBF (Chabbra 1998). A dissertation by Philips in 2000 revealed that when more rigorous definition of EBF is used than the NHFS, some studies have shown rates of 3% or less.

The NHFS-3 India results showed that overall, slightly less than half (46.4%) of children under 6 months are EBF. The median duration of EBF was 2 months. EBF drops from 69% among children below 2 months to 51% (2-3 mo.) to 28% (4-5 mo.). Twenty-two percent of children under 6 months received only breast milk and plain water and 15% drank both, breast milk and other milk (NFHS-3 2007).

The BPNI survey in 2003 showed the EBF rate for Gujarat as 10.4% (4-6 mo.) and 32.1% (0-6 mo.), the study also analysed and presented EBF rate for children 0-3 months as per NFHS-2 (1998-99) as 65.2% (Gupta and Gupta 2004 and NFHS-2 1999). Later on, the DLHS-3 study showed a decline in EBF rates (0-5 mo.) to 41.4% as compared to 47.8% by NFHS-3 for Gujarat (DLHS–3 2010 and NFHS-3 2007). The DLHS-3 survey also revealed a slightly better EBF rates in rural area (41.6 %) as compared to urban (40.6 %).

Thus, since NFHS-2 the practice of EBF has been declining for Gujarat. The present study also found lower EBF rate than the previous survey for Gujarat. The current study reported EBF among children under 6 months, as only 31.9%.

Continued Breastfeeding

Kaushik in 1983 found that 85.1% of mothers at 12 months, 72.4% at 18 months and 57.2% at the end of 24 months continued to breastfed their children. *Benakappa et al.* in 1989 reported a breastfeeding rate as 80.3% at 12 months of age. Later on, Gupta *et al.* in 1992 found that 71.5% of mothers continued breastfeeding for 1 year or more.

In a study conducted by BPNI in 2003, in 49 districts of India, only one-third of the mothers planned to continue breastfeeding for a period below 18 months, 46% of mothers intended to continue breastfeeding the child for 18-24 months and only one

fifth planned to continue beyond 2 years (Gupta and Gupta 2004).

A study by Srivastava and Singh in 2006 reported the continued breastfeeding rate as 86.5%, 72.3% and 52.4% among children 6-11 months, 12-17 months and 18-23 months respectively, in urban slums of Vadodara. Study by Khan *et al.* (2012) in East Delhi reported continued breastfeeding rates (12-23 mo.) as 72.1%.

The analysis of the Pakistan Demographic and Health surveys and other nation's studies on the IYCF indicators showed a slight increase in continuation of breastfeeding, among children (12-15 mo.) from 78.2% to 79% between the two DHS (DHS 1992, DHS 2008). The changes, however is not statistically significant.

The continued breastfeeding rates reported in the current study were better than the Gupta and Gupta 2004 and Srivastava and Singh 2006 study. In the present study continued breastfeeding at one year (12-15 mo.) was 89% and at two years (20-23 mo.) was 68%. Thus, a total of 11% of the mothers were not offering breast milk to their children at 1 year and around a third of mothers stopped breastfeeding by 2 years.

Bottle Breastfeeding

The use of pacifiers and bottles with nipples has been shown to interfere with successful breastfeeding (Righard 1996), leading to reduced duration of breastfeeding (Righard 1998), and 'nipple confusion' in infants (Neifert *et al.* 1995). In third world countries, bottle-feeding poses the additional risk of introducing pathogens into the infant, because of unhygienic practices during handling and preparation leading to increased susceptibility to diarrhea and infections (Redmond *et al.* 2009). The Baby Friendly Hospital Initiative specifically discourages giving artificial 'teats or pacifiers' to breastfeeding infants in its 'Ten steps to successful breastfeeding' (WHO 1998b).

Although the use of bottles with nipples is not common in India, a number of studies conducted in different parts of India, in last two decades have shown varying rate of bottle feeding from 63% to as low as 6% (Table I-46). However, it is important to note that the rate variation also depended on the age group studied.

Banapurmath *et al. (1996) showed that* the major reasons for introducing bottle feeding were "*Not Enough Breast Milk*" (58.1%), subsequent pregnancy (35.8%), and ill health of mother (20.7%). A study in urban low socio economic group, in 1998 showed most mothers used bottles, and only few had proper hygiene (Aggarwal *et al.* 1998).

Table I-46: Trends in Bottle feeding

Location	Age	Prevalence (%)	Reference
SC caste - Haryana	0-3 yr.	9	Kapil *et al.* 1994
Rural central Karnataka	0-24 mo.	49.4	Banapurmath *et al.* 1996
India	0-9 mo.	23	Gupta and Gupta 2004
Rural Uttarakhand	0-9 mo.	63	Gupta and Sharma 2006
Vadodara (urban slum)	0-11 mo.	13.5	Srivastava and Singh 2006
India	<6 mo.	12.5	NFHS-3 2007
	6-8 mo.	17	
	9-11 mo.	18	
Gujarat	<6 mo.	12.3	NFHS-3 2008
	6-8 mo.	16	
	9-11 mo.	6.4	
Pakistan DHS 2008	0-24 mo.	34.1	Hanif 2011
East Delhi	0-24 mo.	26.5	Khan *et al.* 2012

A nationwide study conducted by BPNI in 2003 revealed that, though artificial feeding rate was quite high, however, the rate of bottle-feeding were not equally high (23%) among children's 0-9 mo. (Gupta and Gupta 2004). The NFHS-3 survey has showed even lower bottle feeding rates compared to most of the studies mentioned above. Also as presented in Table I-46, in Gujarat, the bottle feeding rate was comparatively lesser than India (NFHS-3 Gujarat 2008).

In the present study area, the use of bottle was even lower as compared to the others studies. In the present study, only 8.4% children (0-12 mo.) had ever been bottle fed, whereas, the current bottle feeding rate was as low as 5.6%.

Problems in Breastfeeding

The reports from the developing countries has shown that upto 25% mothers face problems in first 7-10 days of starting the breastfeeding and perception of *"Not Enough Breast Milk"* is the single most common predictor of early termination of breastfeeding. The problems of lactation are more common in young age and with first time mothers (Hall *et al.* 2002, Taveras *et al.* 2003, Ertem *et al.* 2002).

A study in Chatradurga district (224 villages) showed 4.5% (19/420) mothers had problems like sore nipples, mastitis, breast engorgement, breast abscess and other illness. The onset of breastfeeding problems in this study was high in the neonatal period especially during the 1st week of birth itself (Mallikarjuna *et al.* 2002). Similarly a study in Chandigarh in 2006 showed that, the problems encountered during hospital stay were nipple anomaly in 26.1%, engorged breast, sore/cracked

nipple because of faulty technique in 25%, perception of *"Not Enough Breast Milk"* in 37.5%, and multiple problems were faced by 11.3% of mothers. Perception of *"Not Enough Breast Milk"* was the most common problem faced by both primi and multi-parous mothers. Engorged breast, sore/cracked nipple was more in the first time mothers (Jain *et al.* 2009)

In the present study 8.6% mothers, of children under 6 months, reported having problem in, with majority of the mothers experiencing problems such as insufficient milk (57.9%) and breast engorgement (36.8%), and around 42% of mothers who experienced problem, discontinued breastfeeding.

Complementary Feeding

Infants are particularly vulnerable during the transition period (6-23 mo.) when CF begins. Ensuring that their nutritional needs are met thus requires that CF be ***Timely*** i.e. introduced when the need for energy and nutrients exceeds what can be provided through exclusive and frequent breastfeeding; ***Adequate*** i.e. provide sufficient energy, protein and micronutrients to meet a growing child's nutritional needs; ***Safe*** meaning that they are hygienically stored and prepared, and fed with clean hands using clean utensils and not bottles and teats; and ***Properly fed*** meaning that they are given consistent with a child's signals of appetite and satiety, and that meal frequency and feeding method – actively encouraging the child, even during illness to consume sufficient food using fingers, spoon or self-feeding – are suitable for that age (WHO 2002).

a) *Age of Introduction of Complementary Foods*

Knowledge and Perceptions

In 1993, a study by Kanani in urban slums of Baroda revealed that more than one –third of slum dwelling women perceived that the child should be weaned at 1 year, as they believed that child should be weaned to solid foods only when they start teething. Further, in 2008 Katara *et al.* (2010) in a study in similar setting (urban slums of Vadodara) showed that only 9.9% of mothers of children 6-23 months were aware that breastfeeding is not sufficient after 6 months of age.

The findings of the current study showed as slightly better picture; however the knowledge and perceptions of mother's still can only be rated as low. Among the mothers of children under 6 months, only 30.9% recommended the correct age of introduction of CF and around 15.5% recommended introduction of top milk before 6 months Only 18.8%, mothers of children below 12 months perceived that child can

eat food from family pot by 1 year. Most of the mother's believed that child can eat food from family pot only around 2 years.

Introduction of CF among 6-9 months

Dr. Patrice (1992) commented using the NFHS-I and NFHS-2 data that in India there is a general delay in introduction of CF. According to the NFHS-1 (1992-93), only 31% of children (6–9 mo.) were receiving foods other than breast milk, although they were receiving water and other liquids. The data from the NFHS-2 (1998-99) showed little improvement with 33% children (6-9 mo.) receiving CF (Engle 2002, NFHS-1 1993, NFHS-2 1999). Over the years, the trend in introduction of CF has improved; in 1994 Bavdekars reported that 48% children (6-10 mo.) in slums of Mumbai were given CF (Bavdekar and Bavdekar 1994). Further, a study in rural central Karnataka showed that 57.3% children (6-10 mo.) received timely CF (Banapurmath *et al.* 1996). In rural Uttarakhand the supplementation of solid and mushy food was found in 93% children 6-9 months (Gupta and Sharma 2006).

A nationwide study conducted by BPNI in 2003 showed that 70% children (6-9 mo.) in India and 74.8% in Gujarat were given solid/semi-solid food (Gupta and Gupta 2004). This was comparatively more than NFHS-3, Patel *et al.* (2012) in secondary analysis of NHFS-3 India, (2005-06) showed that more than half (54.6%) of the children (6–8 mo.) had received solid, semi-solid or soft foods. The study also found that richest households were less likely to delay introduction of CF than other households.

In the current study, 69.2% children (6-8 mo.) were introduced to solid, semi-solid or soft foods. The CF rate was slightly less than that reported by BPNI for Gujarat in 2003, but better than NFHS-3 and similar to that reported by Srivastava and Singh (2006) for urban Vadodara (68.2%, 6-9 mo.)

Mean age of Introduction of CF

In the current study the mean age of introduction of CF was 7.6 months among children 12-23 months. Similarly Katara *et al.* (2010) also reported the mean age of initiation of CF in urban slums of Baroda as 7.6 months. Compared to DLHS-3 survey the present study shows the improvement in practices. The DLHS-3 survey reported the median age in months at the time of introduction of other fluids, semi-solid food and solid food supplementation, among the breastfeeding children as, 6.2, 8.3 and 11.3 months respectively (DLHS-3 2010). An earlier study by Aggarwal *et al.* (2008) reported the mean age of introduction of CF, as 13.37 months.

Introduction of CF among 6-23 months

A study in rural Agra by Chauhan *et al.* (2007) showed that the initiation of CF at 7 months was found in 21.9% infants, while 35.2% infants received CF, between 5-6 months. Sharma and Madalik (2007) showed that in urban slums of Vadodara, only 12.8% children (6-23 mo.) had started on CF at 7 months of age and in 36.2% children CF was delayed beyond 8 months Aggarwal *et al.* in 2008 showed that 86% of the children (6-23 mo.) had started CF, however, only 17.5% children had received CF at 6 months of age and 16% did not start on CF at all. Similarly, Katara *et al.* (2010) showed that in urban slums of Vadodara, 27% of children (N=561, 6-23 mo.) had started receiving CF along with breastfeeding at 6 months of age. Mahmood *et al.* in 2012 showed that about one quarter of the mothers, in rural north India, started CF before 6 months and similar trends were reported by Chudasama *et al.* (2009) in a study conducted in Gujarat.

Comparatively, the current study showed better trends in CF. Overall in the current study, 92.2% children (6-23 mo.) were receiving CF; however, only 37.9% initiated CF from 6 months onwards. Further, 11.9% children (12-23 mo.) were introduced to some type of semi-solid foods even before the age of 6 months, and 24.8% were delayed beyond 8 months, while in 1.4% no semi solid foods were introduced.

Introduction of top milk

Sharma and Madalik (2007) showed that in urban slums of Vadodara, top milk feeding was initiated in 46.8% children before 6 months. Daxini and Kanani (2009) reported that in rural Vadodara more than half of the children (6-23 mo.) were receiving top milk. More number of older children (69%) than younger children (6-11 mo.) received top milk (21%). Age of initiation of top milk varied from <4-6 months.

Comparatively, in the current study, lesser children (6-23 mo.), 40.5% were receiving top milk. However, around 11% were introduced top milk before 6 months. The mean age of introduction of top milk was 7.9 months.

b) *Responsive Feeding*

Feeding is one of the most time-consuming and least well-understood caring practices, with critical effects on child's nutritional status. Good CF behavior has three components: 1) adapting the feeding method to the child's psychomotor abilities (e.g., spoon handling); 2) feeding responsively, including feeding when the child is hungry, encouraging a child to eat, recognizing possible low appetite, balancing child versus caregiver control of eating, and using an affectionate or warm

style of relating to the child during feeding; and 3) creating a satisfactory feeding situation by reducing distractions, developing a consistent feeding schedule, and supervising and protecting children during eating (Engle *et al.* 2000).

Three kinds of feeding styles (Birch and Fisher 1995 and Bentley *et al.* 1999) represent an overall "style" of feeding: controlling; laissez-faire; responsive. In a highly controlling style, sometimes resulting into force feeding, the children may be unable to develop mechanisms for learning to regulate their intake. This style of feeding has been observed in Nigeria, as well as in industrialized countries such as the USA (Brown *et al.* 1988, Johnson and Birch 1994). In a laissez-faire style, the caregiver makes little effort to encourage eating, and may often expect children to eat on their own at an early age. These attitudes may be detrimental when children have low appetites; this style is most frequently observed among families and communities with a higher prevalence of malnourished children (Engle *et al.* 2000).

Finally, a caregiver with a responsive or interactive feeding style responds to the child's hunger cues in reasonable time, feeds using strategies of encouragement and praise, feeds in a consistent manner, and feeds more actively when the child is recovering from an illness. These behaviors are presumed to help the child develop an internal mechanism for regulating food intake (Engle *et al.* 2000).

Srivastava and Singh (2006) reported that 36.2% mothers in urban slums of Vadodara followed more than 3 positive psychosocial care practices. A study by Chauhan *et al.* (2007) in rural Agra, among children 7-12 mo, showed that demand feeding was being practiced by 66.7% mothers. Further, 40.9% infants were found to be fed with mother's hand and 45.7% mothers were such who fed their infants by sitting along with them, and out of which 95.8% were housewives. Only 4.8% infants were having separate plate and spoon for feeding. Aggarwal *et al.* (2008) reported that the most common reason (52%) for inappropriate practice in mothers (N=154) having children 6-24 months, who delayed feeds was "*tried but did not eat, vomits everything*".

In the current study the knowledge and perceptions assessment of the mothers of children below 1 year showed that, only 22.8% mothers knew that the child can eat by self at around 2 years. Further, 83% mothers of children under two years believed that caregiver should sit and monitor, how much child eats.

Wright *et al.* (2006) showed that mothers responded to food refusal to a varying extent; the most common response (reported often or sometimes) at both ages was to encourage the child to eat (8 mo. 81%; 12 mo. 90%) and to offer alternative foods (8 mo. 84%; 12 mo. 85%). Mothers were less likely to offer the same food later (8

mo.: 34%; 12 mo: 33%). Few reported “making” the child eat (8 mo. 7%; 12 mo. 5%), but this was more common in those who often encouraged the child to eat (aged 8 mo. relative risk [RR]: = 4.3; P [$\chi 2$] = .003; 12 mo. RR: 4.5; p=0.025) and at 12 months. in those who often offered the same food later (RR: 6.6; p=0.004). Mothers who tended to offer alternative food immediately or later were also significantly more likely to encourage eating, but not to offer the same foods or force feed.

In the current study, inquiring about mother’s response to child’s refusal to complete the given food, majority of the mothers advised to leave the child (34.3%) reflecting the laissez-faire style. Around 30.3% mothers believed in encouraging the child, reflecting responsive feeding style further, 10.3% mothers recommended, offering alternate foods to the child and 4.5% recommended forcing the child to complete the food.

c) *Hand-washing by Children before Eating*

The Cochrane database review in 2008 concluded that hand-washing can reduce diarrhoea episodes by about 30%. This significant reduction is comparable to the effect of providing clean water in low-income areas (Ejemot *et al.* 2008).

Srivastava and Singh in 2006 reported that only 2.6% mothers reported washing their hands with soap/ash for all of following; before food preparation; before infant feeding or child feeding; after defecations; after attending to a child who has defecated. A study in rural Agra showed that the practice of cleaning hands before feeding was very poor (17.1%) among mothers with children 7-12 mo of age (Chauhan *et al.* 2007). Katara *et al.* (2010) in a study in urban slums of Vadodara reported that 66.1% children (6-23 mo.) followed hand-washing practices before eating.

In the current study, the practice of hand-washing was better with 82.4% mothers, having children between 6-23 months, reporting that they ensure hand-washing by their child before eating. However, only 33.5% washed their hands using soap and water.

d) *Amount of Complementary Food*

Aggarwal *et al.* in 2008 showed that the knowledge about adequate quantity of CF was present in 46.5% of mothers of children 6-23 months, whereas only 25% children were actually provided adequate quantity of CF. Daxini and Kanani in 2009 showed that, <60% RDA for calories and <30% RDA from iron, calcium, vitamin A and vitamin C, was met in children (6-23 mo.) in rural Vadodara. A study in 2008, in Bankura district, West Bengal, reported that appropriate feeding as per the IMNCI

protocol was significantly less among infants aged 6-11 months (15.2%) and children aged 12-23 months (8.7%) compared to infants aged less than 6 months (57.1%), which could be attributable to low frequency and amount of CF (Sinhababu *et al.* 2010).

Similarly in the current study, the quantity of CF given to breastfed and non-breastfed children was very less as compared to the recommended IMNCI guidelines. Majority of children were given as little as 50 to 80 ml per serving. Only 1.6% breastfed children (9-11 mo.) consumed 200 ml of CF per serving, whereas none of the children above 1 year consumed, as recommended, more than 200 ml per serving.

e) *Food Consistency*

In the current study, most of the mothers were not aware of the consistency of CF. As a result most of the mother's recommended very thin liquid like consistency, and only 5.7% mothers recommended thick food and 19.6% recommended solid foods mainly biscuits.

Assessing the actual consistency of CF, only 40% and 74% children 6-8 months and 9-23 months respectively consumed the appropriate consistency. It was also important to note here that around 31% and 3% children 6-8 months and 9-23 months had not yet started any CF.

Aggarwal *et al.* (2008) showed that only 25.5% mothers of children 6-23 months were aware of the thick consistency of CF, whereas, only 38% were providing food with thick consistency.

f) *Meal Frequency and Energy Density*

In the present study, the knowledge and perception of mothers of children below 12 months on feeding frequency was very poor. Only around 30% and 12% mothers recommended feeding child 7-11 months (3 times a day) and above 12 months (5 times a day) respectively, with correct frequency.

Minimum Diet Diversity: In the current study, overall, around one quarter children (6-23 mo.) consumed food from at least 4 of the 7 food groups listed above.

The dietary diversity was better as the age advanced. The dietary diversity was least among 6-11 months breastfed children 16.5% and maximum among 18-23 months non-breastfed children 63%.

Overall, the median number of food groups consumed by children (6-23 mo.) was only 2 in last 24 hours, which was less than the minimum dietary diversity. However, with increase in age the median number of food groups consumed increased from 2

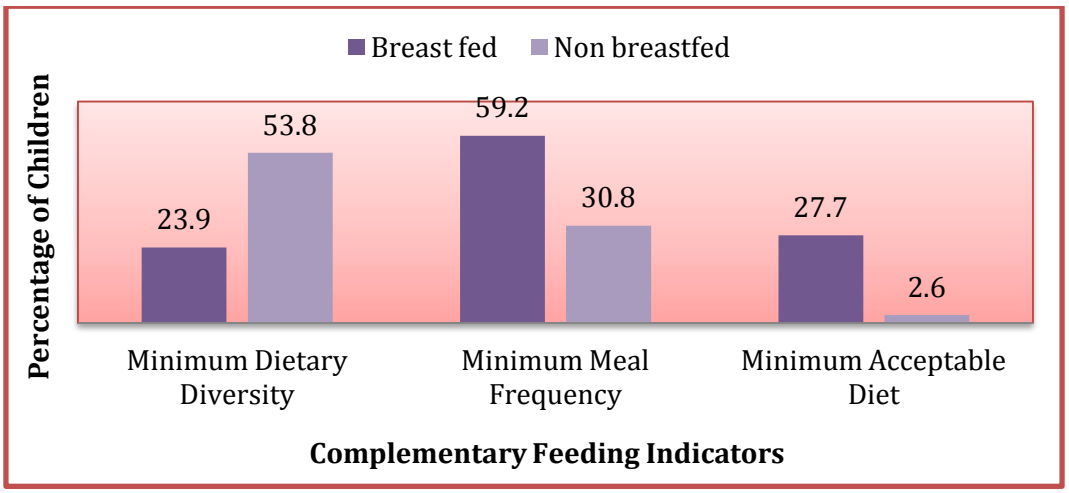
to 4 food groups.

The NFHS-3 survey for India showed better results with 35.8% of male and 34.8% of female children (6-23 mo.) receiving appropriate number of food groups (NFHS-3 2007). Studies in urban slum of Vadodara, showed that the average (mean) number of food groups consumed by children (6-23 mo.) preceding the survey was 3.5 (Srivastava and Singh 2006) and only 64.7% children were receiving feeding with appropriate number of food articles (Katara *et al.* 2010).

Minimum Meal Frequency: In the current study, around 56% children (6-23 mo.) were fed as per the recommended norms of minimum feeding frequency. Among the breastfed, the minimum meal frequency was better in the younger age group (6-8 mo., 66.7%) as compared to the older age group (9-23 mo., 57.8%). The minimum meal frequency among breastfed was better than non-breastfed (Figure I-6).

Similarly Katara *et al.* (2010) and Khan *et al.* (2012) showed that, 53.2% and 48.6% of children (6-23 mo.), in urban slums of Vadodara and East Delhi were receiving feeds at least minimum number of times.

Figure I-6: Status of Meal Frequency and Dietary Diversity among Breastfed and Non-breastfed children (6- 23 months)

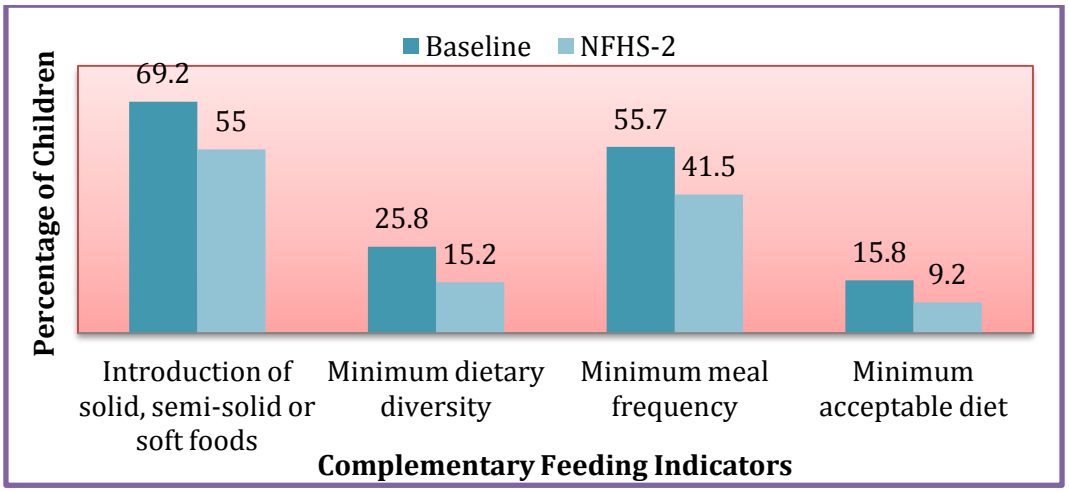


Minimum Acceptable Diet: In the current study, only 15.8% children received the minimum acceptable diet in 24 hours preceding the survey, overall presenting a very poor picture.

Patel *et al.* in a secondary analysis of NHFS-3 India, (2005-06) showed that a very low proportion of children (6–23 mo.) in India received adequate CF as measured by the WHO indicators. Further the rates were lower than the current study as presented in Figure I-7 (Patel *et al.* 2012). A recent study in East Delhi reported minimum acceptable diet among children 6-23 months greater than reported in the current

study, 19.1% (Khan *et al.* 2012).

Figure I-7: Status of Complementary Feeding Core Indicators



Finally, the analyses on the status of the CF indicators in South Asian, summarized by Senarath *et al.* (2012) showed that other than Sri Lanka, where all four indicators were above 65%, in the other countries i.e. India, Nepal and Bangladesh, where data were available, CF practices are poor. The rates ranged from an abysmally low proportion of children who met the indicator cut-offs for a minimum acceptable diet (9.2% in India) to a high proportion of children who achieved minimum meal frequency (88.3% in Sri Lanka).

Milk feeding frequency for non-breastfed children

In the current study, among the non-breastfed children, around 72% had consumed more than one milk item in the last 24 hours, and only 21% non-breastfed children had consumed at least 2 milk items in last 24 hours. Similarly, the NFHS-3 survey for India showed that among the non-breastfed children 75.2% children (6-23 mo.) consumed milk other than breast milk i.e. tinned, powdered, and fresh animal milk and 17.7% consumed cheese, yogurt or other milk products in the 24 hours preceding the survey (NFHS-3 2007)

g) *Type of Complementary Foods*

In the current study, around 81% children were breastfed in the 24 hours preceding the survey. Overall, the consumption pattern of foods from the seven food groups was below average, except for the consumption of cereal grains, roots and tubers (87%). Less than half of children were fed legumes and nuts, and over three-fourth were fed dairy products. The consumption of other fruits and vegetables was only 24%. Non vegetarian food and egg was consumed by only 1% to 2% children

respectively.

Katara *et al.* (2010) reported better feeding frequency in the urban slums of Vadodara, with a majority of children getting food prepared from cereals (96%) followed by pulses (76.8%), fruits and vegetables (79%). Milk and milk products were consumed by two-third children. Only one-third of the children were eating non-vegetarian diet. As cereal is the staple diet, it was the base of the CF for majority of the children.

In the current study among the breastfed and non-breastfed children, the non-breastfed children had better frequency of consumption of all food groups as compared to breastfed children. The consumption pattern of all major food items was better among non-breastfed as compared to breastfed, except from '*Balbhog'* and biscuits which was surprisingly consumed more among breastfed children as compared to non-breastfed.

Chauhan *et al.* (2007) showed that (N=152) in rural Agra, the CF given to the infants (7-12 mo.) was commonly (88.6%) of semi-solid consistency which were like – *khichdi, dalia* (wheat porridge), boiled potato, GLV, boiled rice water, *lapsi* and roti soaked in milk after culturally being adviced by elders and relatives. Thus mostly the food prepared from the family was given to 87.1% infants. There was no significant association between standard of living index and the practice of family pot feeding ($p<0.05$).

In Central Karnataka, a community-based study (N=1050, 0-24 mo.) reported that 94.7% of mothers used homemade weaning foods, whereas only 5.3% used commercial foods (Banapurmath *et al.* 1996). This was comparable to a report of 8.3% in a similar study from Haryana (Kapil *et al.* 1995). Chauhan *et al.* (2007) showed that readymade foods were not found to be given to the infants so commonly. Only a few mothers belonging to high socio-economic status were reported to give RTE to their infants. Similarly, few children (6-9 mo.), in rural Uttarakhand were found receiving fruit juice and other soft drinks, sweetened water, tea/coffee and powdered/tinned milk and others which is an un-healthy practice (Gupta and Sharma 2006).

However, in the current study, other than the routine homemade food, around 72% children (6-23 mo.) consumed outside snacks including beverages, packaged snacks, ice creams and chocolates. One of the reasons for a higher percentage of children eating out side food in the current study may be the age group in this study, 6-23 months, as compared to the younger age group 6-9 months in the previous study.

With reference to use of energy denser food, in the current study, around 92% households used at least one of the energy dense food like oil, ghee, sugar and jaggery in cooking, however only, 35% families practiced top addition of these items for children to enhance the energy density of CF. Among the energy dense food the most common item used as top addition and cooking respectively, were oil (17.3% and 74.3%) followed by ghee (13.3% and 22.5%) and sugar (8.7% and 80.6%). Jaggery was least used as top addition for 2.9% children (6-23 mo.).

The NNMB survey (2004-05) reported that in Gujarat children 1 to 3 years consumed less than one fourth, i.e. 6 gm, oil per day as compared to the recommended intake of 25 gm per day, whereas the consumption of jaggery and sugar was even less (only 4 gm as compared to the RDA of 30 gm per day). Katara *et al.* (2010) reported that in urban slums of Vadodara, majority of children (6-23 mo.) were deprived of fats in their diet.

Lastly in the current study, the consumption of any iron-rich foods (i.e. fortified *Balbhog*, GLV, egg and flesh foods) excluding any supplement was around 36%. The consumption of iron-rich food was better among non-breastfed (43.9%) as compared to breastfed (38.6%) children. Among all iron-rich foods the major source was ICDS fortified *Balbhog* (32.7%), whereas flesh food and egg contributed to only around 8%. The consumption of IFA tablets, at least once was reported by only 7% children.

The NNMB survey (2004-05) report for Gujarat showed a consumption of 6.5 mg as compared to the RDA of 12 mg per day, among children 1 to 3 year. Better than the the finding of the current study, the NFHS-3 survey for Gujarat (2008) showed only 6% children (6-35 mo.) consuming iron-rich foods (such as meat, organ meat, fish, poultry, and eggs) and 10% children (6-59 mo.) receiving iron supplements in the week before the interview. In India 15% of children have been reported to consumed foods rich in iron and only 5% children received an iron supplement (NFHS-3 2007).

h) *Feeding During and After Illness*

Food restriction in illness leads to calorie deprivation and malnutrition, with frequent illnesses. Malnutrition causes mucosal damage and lowers immunity, leading to a vicious cycle of infection and malnutrition. When a child is recovering, an extra meal for 2 weeks is needed. A child's illness is a crucial moment for counselling of child feeding (Benakappa and Shivamurthy 2012).

In the current study, only 24.5% mothers were aware of increasing the number of meals and/or quantity of food during illness. As against this, Srivastava and Singh

(2006) in urban slums of Vadodara showed that 59.4% sick children (6-23 mo.) received continued feeding during an illness.

While positive attitudes towards diet during illness are very few, negative attitudes and diet restrictions without scientific basis are widely prevalent.

A study by Benakappa and Shivamurthy (2012) on 126 caregivers of ill children from the Medical College, Karnataka, India showed that among Children under 6 months, while 38.2% caregivers believed that breastfeeding frequency should be decreased, 3% stopped feeding completely and only 3% felt that breastfeeding should be increased. Nine percent of the mothers withheld breastfeeding when they were ill as they believed that illness would be transmitted to the child. Among those who gave CF, 12.5% diluted the CF during illness and 43% caregivers stopped giving CF. The reasons given for decreased feeds during illness include "child is tired," "child cannot suck" and "child cannot digest during illness". Among children 7-24 months, 19% caregivers felt breastfeeding frequency should be decreased and 5% felt the need to increase feeds. 11% discontinued breastfeeding when the mother was ill. While 23.6% reduced the frequency of CF, 34.5% stopped CF completely. 33% preferred thinner food during illness and 72% discontinued non vegetarian food. Calorie intake during illness was very less and statistically significant.

In a study in randomly selected 35 *Anganwadi* areas of Kutumba, Aurangabad and Bihar, the authors found that instead of providing more nutrition during illnesses to meet children's increased nutritional demand, mothers restrict food, a practice with potentially disastrous consequences (Sharma and Thakur 1995).

Kapil *et al.* (1990) showed, that while some foods were preferred others were restricted during episode of each illness, depending upon their 'hot' and 'cold', 'light' and 'heavy' and other characteristics, as determined by locally prevalent traditional dietary beliefs.

A study at the Community Health Centre, of The Aga Khan University Hospital, Karachi showed that, the major sources of information about restriction of various foods during different illnesses were relatives. Sixty five percent of the respondents believed that heavy food should be restricted during diarrhoea and oily food during jaundice. Sixty six percent of the respondents believed that cold food should be restricted during cold/cough and 23% believed that oily food should be restricted during typhoid. Surprisingly, medical doctors and other health care givers were also the source of information for advising food restrictions in certain childhood illnesses (Ali *et al.* 2003).

Lastly, in the current study, 83% mother's breastfeed their child suffering from

diarrhea, whereas the DLHS-3 survey for Gujarat (2010) showed that, only 11.9% mother recommended continuing breastfeeding during diarrheas.

3. Utilization of Integrated Child Development Services for Children Under two Years

a) *Growth Monitoring and Promotion*

Growth Monitoring and Promotion (GMP) consists of three steps; weight measurement, plotting the weight on to a graph to compare it to a standard, and using the information of growth trend to counsel caregivers to improve or sustain child growth. The GMP is a preventive and promotional tool, which helps in identifying a child with a nutritional or health problem, thus enabling service providers such as AWWs and caregivers such as mothers, to take action before child's nutritional status is seriously jeopardized. The nutritional status assessed by growth monitoring is also used to determine eligibility for additional supplementary food (*Balbhog*) to children. All children severely underweight are given additional 1.5 kilograms of supplementary food as '*Balbhog*' over and above the monthly 3.5 kilograms of supplementary food entitlement. The AWWs in the state have been asked to weigh all children under five years on a monthly basis, preferably on *MAMTA DAY (*Village Health and Nutrition Day*)*.

Assessing the knowledge of lactating mothers (children below 1 year) and pregnant women, it was found that only 79.5% (280/352) lactating mother's and 69.4% (75/108) pregnant women perceived regular weighing of children as important. Further, only 53.1% (187/352) lactating mothers and 33.3% (36/108) pregnant women were aware that a child needs to be weighted on a monthly basis.

Among children under two years, it was found that almost all children were weighed at least once (98.8%), and, around 91.4% were weighed by ICDS AWW at the AWC on *MAMTA DAY* and/or during home visit (Table I-47). A total of 68.5% children were weighed within one month preceding the survey. Overall, 90.9% children were weighed once within 3 months preceding the survey. The duration between two weight measurements ranged from 0 to 17 months.

Table I-47: Status of Growth Monitoring and Promotion among Children Under Two Years

Indicators	% (N=571)
Place of Weighing	
AWC/*MAMTA DAY*/Home visits	91.4 (522)
– *MAMTA DAY*	69.2 (395)
– AWC	78.5 (448)
– Home visits	11.0 (63)
Private	3.9 (22)
Government Hospital	3.5 (20)
Never weighed	1.2 (7)
Duration between the last weight done	
Within last 30 days	68.5 (391)
Within last two months	86.0 (491)
Within last 3 mo.	90.9 (519)
>=3 mo. ago	6.0 (34)
Don't know / No Response	3.9 (22)

For weight measurement to be effective it must be followed by representation of weight in graph and educational or promotional element to raise mother's commitment to child growth and nutrition. The analysis shows that, although weights of 30.6% children were plotted on *MAMTA* card growth chart, only in the case of 16.6% children's plotting was done on *MAMTA* card growth chart immediately following the weight measurement. Further, 25.4% children had no plotting on *MAMTA* card growth chart, and others had issues like not brining the *MAMTA* card during weight measurement (17.2%), card being lost (15.4%) and card not being issued (6.0%).

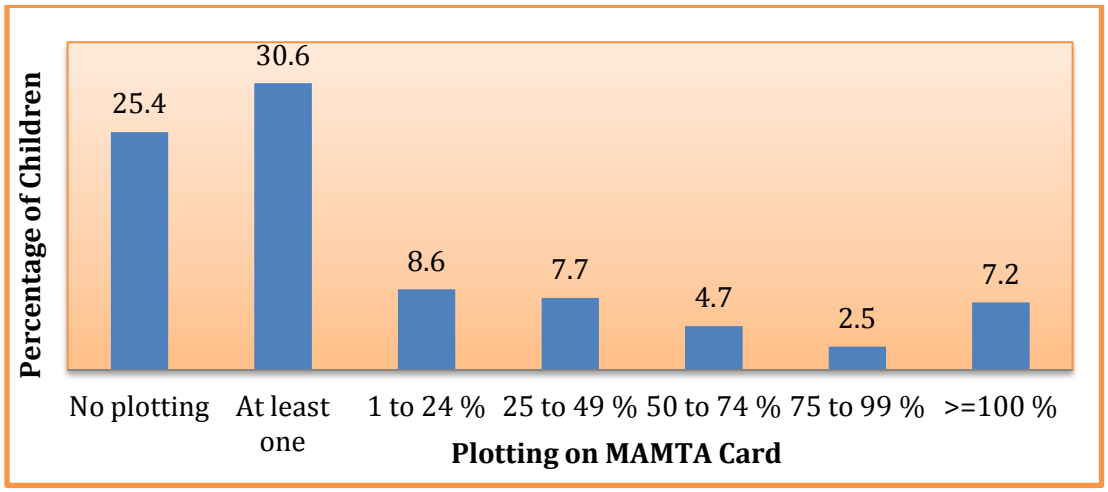
The number of plots on *MAMTA* card and the age of child in months were compared to see whether the weight measurements were taken every month for a respective child. This was a rough estimate of whether the GMP was conducted regularly for the child. As presented in Figure I-8, it was noted that overall, 7.2% children had 100% or more plotting on *MAMTA* card. Majority of the children 16.3% had less than 50% plotting on *MAMTA* card.

The most unexpected information was that majority of plotting on *MAMTA* card was being done by ANM/FHW (11.9%, 68/571), followed by AWW (5.1%, 29/571) as reported by the mothers.

Lastly, the parents' awareness on the index child's nutritional status was assessed. On inquiring about the child's nutritional status (healthy/ malnourished), growth chart grade, weight and grade color, it was noted that, only 15.6% (89/571) knew the actual weight of the child, as low as 10.3% (59/571) knew their child's nutritional

status, and only 3.7% (21/571) knew the correct grade color on growth chart where the child's weight was plotted last time.

Figure I-8: Status of *MAMTA* Card Plotting during Growth Monitoring and Promotion (N=571)



Note: *Percents may not add upto 100 due to missing values*

Discussion – Growth Monitoring and Promotion

The above section reveals an incomplete implementation of the GMP activity. As presented in Table I-48, although 91.4% children were weighed at the AWC or *MAMTA DAY* or during home visits, only 68.5% reported to be weighed regularly, every month. Further, 30.6% had plotting on *MAMTA* card, but following weight measurement, only 16.6% reported plotting on *MAMTA* card. Overall, only 7.2% children had 100% or more plotting on *MAMTA* card, and only 5.1% reported plotting on *MAMTA* card by AWW.

Such poor implementation of GMP in the current study has a direct impact on the parents' awareness of their child's nutritional status. Overall, only 18.4% parents were aware of their index child's nutritional status (healthy/ malnourished) or correct weight or grade color on growth chart.

Table I- 48: Baseline Status of GMP of Children (0-23 months)

Percentage (N=571)	GMP Status
GMP Frequency	
98.8	Weight at least once
91.4	Weighed at the AWC and/or *MAMTA DAY* and/or during home visits
90.9	Weighed once within 3 mo. preceding the survey
68.5	Weighed within 1 mo. preceding the survey

Percentage (N=571)	GMP Status
Plotting on *MAMTA* card growth chart	
30.6	Yes
25.4	No
16.6	Reported plotting on *MAMTA* card growth chart, following the weight measurement
16.3	Less than 50% plotting
7.2	100% or more plotting
Plotting Source	
11.9	ANM/FHW
5.1	*Anganwadi* Worker
***MAMTA* card availability for GMP**	
17.2	Not brining the *MAMTA* card during weight measurement
15.4	Card lost
6.0	Card not issued
Parents awareness on the index child's nutritional status	
15.6	Actual weight of the child
10.3	Child's nutritional status
3.7	Correct grade color on growth chart

A special article by Ray (2005) revealed that, the growth monitoring services in the ICDS scheme meant only weight recording and were not satisfactory. Even majority of the AWW stated that it meant monthly weight recording of children while only few knew that, it is in addition to plotting these on growth charts and advising mothers if growth was not proper. Around 60% of caregivers did not know about growth monitoring. The author thus recommended that the concept of growth monitoring should be changed to growth surveillance to emphasize more on the action components of it. Further, a community based cross sectional study in ICDS Blocks (5) in Rohtak district, showed that the involvement of mothers (N=408, 1-3 years) in growth monitoring is very low (Prinja *et al.* 2008).

The NFHS-3 (2005-06) showed that in Gujarat; about one-quarter of children receive health check-ups and growth monitoring services at an *Anganwadi* centre (AWC). Forty-five percent of mothers of children who were weighed at an AWC received counseling from an AWW after the child was weighed. Whereas in India, only 18% of children (0-59 mo.) had their weight measured in an AWC. Mothers of only half of the children who were weighed received counselling services from an AWC after their child was weighed (NFHS-3 2007).

Sharma and Mandlik (2007) reported that in the urban slums of Baroda, the growth of most (89%) of the children was monitored. Kanani (2008) reported that in Gujarat the weight measurement of children was carried out in 50% of rural and tribal area and not at all in urban area. Prinja (2008) concluded that involvement of mothers in

growth monitoring is an integral component of the activity, which however has been reduced to a mere routine of weight recording with only 2.9% mothers having knowledge of nutritional status of their child in terms of the growth chart.

Similarly, in central Karnataka, Rashmi and Vijaykumar in 2010 reported that 89% of AWW plotted the growth chart properly. Education to mother on growth monitoring was very poor (12.5%). None were told about the growth card; only 33% of AWWs informed mothers about whether the child had gained or lost weight compared to earlier session. No female health worker told about balanced diet, locally available food, and when the mother has to have her child's weight checked. Around 44% of AWWs made recommendation regarding child's feeding and care. The mother's knowledge about growth of her child was poor. Only 41% had some knowledge; none knew about next weighing session, 31% of mothers knew about weight gain or weight loss compared to earlier session.

A study by Ray (2011) in some blocks of West Bengal found out that a majority of the mothers or caregivers understood that growth monitoring meant recording of weight, which was carried out mainly from an ICDS center. However, they hardly understood the importance of this service (only around 3-4% knew it as an important tool to identify faltering of growth). Recently, Mohmood *et al.* (2012) in a study on rural population of North India showed that a majority (69.9%) of the mothers did not receive advice on child feeding.

Thus it can be concluded that there is a minimal use of GMP as an educational tool, by AWWs, for educating mothers on their respective child's nutritional status, related IYCF practices.

b) *Village Health and Nutrition Day (MAMTA DAY)*

MAMTA DAY is a joint health and nutrition intervention strategy to deliver outreach services related to maternal and child health in every village, in the state of Gujarat, every month on one of the designated Wednesdays. This event provides an interface between community and health and ICDS systems, gives an opportunity to weigh and assess the nutritional status of children, and provide counseling to mothers and caregivers on IYCF, along with package of health services such as routine immunization of children.

The analysis of participation on *MAMTA DAY* shows that, although around 98% mothers of children below 2 years and pregnant women were participating on *MAMTA DAY*, less than a quarter knew that the monthly Health and Nutrition Day

was called "*MAMTA DAY*" (Table I-49).

On inquiring about the *MAMTA DAY* schedule, around 58% to 60% respondents reported that they did not know the schedule day; only about 13% to 14% were correctly aware of the scheduled day for *MAMTA DAY* in their respective village.

The distance for *MAMTA DAY* celebration was not very far, with majority, about 80 to 90% respondents informing that the venue was less than 10 minutes away from their residence. The average time required to reach was around 6 minutes and maximum distance, to reach the venue, reported was 20 minutes.

Table I-49 also showed that only 49.7% mothers of children below 2 years and 64.5% pregnant women had attended the last *MAMTA DAY* celebration in their respective areas.

Table I-49: *MAMTA DAY* - Awareness and Service Utilization Status

Indicators	Mother's of children U-2 yr % (N=571)	Pregnant Women % (N=107)
Heard about *MAMTA DAY*	13.1 (75)	21.5 (23)
Attending *MAMTA DAY*	97.5 (557)	98.1 (105)
Aware of *MAMTA DAY* Schedule		
– Correct	14.0 (80)	13.1 (14)
– Partially correct	22.8 (130)	22.4 (24)
– Incorrect	2.1 (12)	1.9 (2)
Distance of *MAMTA DAY* center from home	**N=573**	
– < 5 min	6.1 (35)	45.8 (49)
– 5 to < 10 min	85.3 (487)	34.6 (37)
– 10 to < 15 min		10.3 (11)
– 15 to 20 min	4.9 (28)	6.5 (7)
Attended last *MAMTA DAY*	49.7 (284)	64.5 (69)
Reasons for not attending last *MAMTA DAY*		
Out of station; *Piyar (parents place), Hospital; 'Gone to hospital', Gone for delivery to hospital, 'out of station', stays in city*	11.2 (64)	14.0 (15)
No time; *Work, social reason 'funeral, wedding etc', nobody at home*	6.5 (37)	5.6 (6)
Not informed; *Nobody called, not aware*	8.4 (48)	4.7 (5)
Vaccination; *'Vaccine completed, Baby above 1 year, "Don't get vaccine from here"*	3.9 (22)	0.0 (0)

Awareness and Utilization of MAMTA Card

The mother and child protection card known as '*MAMTA* card' in Gujarat, has all the key messages on health and nutrition care from pregnancy till the child is 5 years of age, including immunization schedule, GMP chart and IYCF guidelines.

It is expected that the AWWs provide individualized and group counselling to caregivers with children below 5 years, on various child care components; especially

the respective nutritional status of child and optimal IYCF practices, using *MAMTA* card.

However, in the current study, only 30.6% (175/572) mothers were ever counseled or explained child care components of *MAMTA* card. Majority of the mothers 19.6% (112/572) were counseled by ANM/FHW. Importantly, only 9.3% (53/572) reported having explained by AWWs, which shows the limited use of *MAMTA* card by AWWs, as a tool for interpersonal counselling and behavior change, especially on child care practices.

Most of the mothers recollected being explained, from the *MAMTA* card, on birth weight (49.1%, 26/53), breastfeeding initiation (22.6%, 12/53), EBF (3.8%, 2/53) and IYCF messages (18.9%, 10/53).

With reference to the use GMP chart from *MAMTA* card by AWWs, only 3.8% (2/53) mothers reported being explained growth chart color and only 1/53 mothers was explained about change in child's nutrition status with changing weight. Thus overall, counselling of mother's using growth chart and IYCF messages from *MAMTA* card, by AWWs was very poor, which could be one of the major reasons for failure in bringing about behavior change in IYCF practices of children below 3 years.

Assessing the use and understanding of *MAMTA* card by mothers of children below 2 years, as seen in TableI-50, less than 20% mothers reported having referred the *MAMTA* card. Only around 12.3% (70/571) mothers could understand the growth chart colors and/or IYCF messages (12.4%, 71/571) from *MAMTA* card. The mothers understanding of growth chart grades 1.4% (8/571) and curves 7.2% (41/571), from *MAMTA* card was minimal

Table I-50: Mother's Referencing IYCF Guidelines on MAMTA Card

Mother's Referring to the feeding guidelines in *MAMTA* card	% (N=571)
Yes by self	18.7 (107)
Yes via friend/relative/family member/AW/ANM	1.2 (7)
No	37.1 (212)
Can't read	21.5 (123)
No response/ Don't know	0.4 (2)
Mother having bal *MAMTA* card	12.4 (71)
No *MAMTA* card /Card not issued	6.0 (34)

Discussion – Village Health and Nutrition Day

In the present study area, even though 97.6% (662/678) participation had attended the *MAMTA DAY*, only 14.5% (98/678) mothers' of children below 2 years and pregnant women knew it as '*MAMTA DAY*' and 13.9% (94/678) were correctly aware aware of *MAMTA DAY*'s schedule. Similarly in a study in urban slums of Vadodara, only few beneficiaries were aware of '*MAMTA DAY*' while 21% identified *MAMTA DAY* as only 'Immunization Day' (Kanani and Majumdar 2009).

In the current study, even though the *MAMTA DAY* venue was within 10 minutes reach for around 90% participants only around half of the respondents reported having attended the last *MAMTA DAY* celebration in their respective areas. A similar study by Bhanderi *et al.* (2009) in Anand district of Gujarat showed that the registration of children and pregnant mothers under *MAMTA Abhiyan* was 91% and 84% respectively. The study also reported that only 53% children were brought to *MAMTA DAY* centre regularly.

Awareness and Utilization of MAMTA Card

In the current study, the use of *MAMTA* card by AWWs, as a tool for interpersonal counselling and behavior change, especially on child care practices was least. Overall only 31% mothers were ever counseled or explained about child care component from the *MAMTA* card, and only 9% reported having been explained by AWWs.

Among those who were counseled, the *MAMTA* card was used least for counseling on GMP (less than 4%) and IYCF messages (less than 20%). As a result, the mothers understanding of growth chart grades and curves, from *MAMTA* card was also minimal, <20% mothers reported having referred the *MAMTA* card and only around 12% mothers could understand the growth chart colors and/or IYCF messages from *MAMTA* card.

Similarly, Kanani in 2008 reported that in the state of Gujarat, growth chart (*MAMTA* card) was not used for counseling on growth and development of child.

A study in urban slums of Vadodara (N=120) showed that about half (54%) of mothers of children recalled being counseled. However, counseling on health care or diet during pregnancy and for children was received by less than one-third of women using *MAMTA* card. In general despite the fact that *MAMTA* card is an illustrated, colorful and effective IEC tool, it was not used adequately by ANMs for counseling (Kanani and Majumdar 2009).

Kotecha and Singh (2012) in a recent process evaluation of *MAMTA DAY* in urban slum areas of Bhavnagar Municipal Corporation showed that only at 13.3% session sites, only few infants / children upto the age of five years were weighed and the weigh was recorded in to the *MAMTA* card.

c) *Awareness and Utilization of Balbhog Supplementation*

It was important to examine the access and utilization of *Balbhog,* distributed by ICDS for children 6-36 months, which can have an significial impact on nutrition status, if consumed as expected.

It was found that only 84.7% (294/347) children (6-23 mo.), were receiving any supplementary nutrition from ICDS, including *Balbhog* and/or cooked snacks.Overall, 83.6% (290/347) were receiving *Balbhog*. The reasons for not taking *Balbhog* by some families varied from; not interested in taking *Balbhog*, no time to collect, stay far so difficult to go, don't give anything, not required, not aware or not informed about collecting *Balbhog*. There were some familes who also belived that the helper or AWW should come to their home and give *Balbhog*.

Further, it was also noted that 59.4% (205/345) mother's reported being counselled about the importance of *Balbhog* by any source and only 55.1% (190/345) repoted being counseled by the AWW.

Status of Balbhog Distribution by Anganwadi Centers

As mentioned previously, all eligible children (6-36 mo.) registered at AWCs are entitled to receive seven packets of *Balbhog,* every month. However, it was found that only 28.5% (99/347) reported monthly and 38.3% (133) reported having received *Balbhog* twice in a month. The remaining mother's gave a varied response, weekly (3.2%, 11), sometimes (3.7%, 13), no fixed schedule (1.7%, 6), when called (1.4%, 5) etc. As per the prevalent practice majority of the mother's reported having received *Balbhog* as soon as the stock arrives (60.5%, 210).

Although *Balbhog* packets were scheduled to be distributed on *MAMTA DAY*, after GMP and IYCF counselling, only, 3.2% (11) mothers of children (6-23 mo.) reported having received *Balbhog* on *MAMTA DAY*. Some of the other mother's reported having received *Balbhog* as follows; during home visits/home delivery (8.1%, 28), on demand (0.6%, 2) etc.

It was noted that only 72.3% (251) had received packet of *Balbhog* in the previous month. Majority of mothers, 59.7% (207) reported having received two packets, and 11.5% (n=40) reported having received four packets. None of the mother's reported

having received all 7 packets, at the time of last distribution of *Balbhog*. .

Household Utilization of Balbhog

For assessing the actual usage of *Balbhog*, mothers were questioned about weekly (i.e. number of days in a week) and daily (number of times in a day) frequency of giving *Balbhog* to their children. The information collected was cross verified with the actual frequency of *Balbhog* given to the children preceding the survey.

In the current study, only 61.8% (147/238) families stated that they gave *Balbhog* to their children daily i.e. 7 days in a week. However, when cross checked, only 34.9% (83/238) families reported giving *Balbhog* for all 7 days preceding the survey. As presented in Figure I-9, among the older children, 43% children 12-24 months were given *Balbhog* on daily bases as compared to only 24% children in younger age group of 6 to 8 months

With reference to frequency of consumption of *Balbhog* in a day, 48.2% parents reported to feed *Balbhog* more than once when prepared. However, when actually assessed, among those who were fed *Balbhog* in last 24 hour, 41.2% were fed more than one time.

It was found that although 84% (290/345) of children (6-23 mo.) were receiving *Balbhog*, 15% mothers in spite of receiving *Balbhog* were not feeding the same to their children. Most of the mothers gave the following two reasons for not feeding *Balbhog*; child dislikes *Balbhog* (not palatable) 7.0% (24); child does not eat anything 5.8% (20). The other reasons given by one or two mothers were; never tried *Balbhog*; only son so doesn't give; gets diarrhea; not aware; the doctor says no; family says no.

Assessing the extent of utilization of *Balbhog*, mothers were asked to list the recipes' which she prepared from *Balbhog.* Most of the mother's listed one (38.8%, 134/345) or two recipes (12.8%, 44), maximum recipes listed by any mother was six. The most common recipe listed was *Sheera* (39.4%, 136), *Rab* (23.8%, 82) and *Sukhadi* (10.7%, 37). In all 20 recipes were listed by mothers.

Even though, 69.0% (238) mothers were giving *Balbhog* to their children, only 43.2% (149) mothers experienced giving *Balbhog* to their children as beneficial (Figure I-10). A majority of the mothers experienced the benefit of *Balbhog* on child's weight 15.1% (52) followed by child's health 11.6% (40), and child's appetite 6.4% (22).

Figure I-9: Age Group Wise Weekly Frequency of Consumption of *Balbhog*

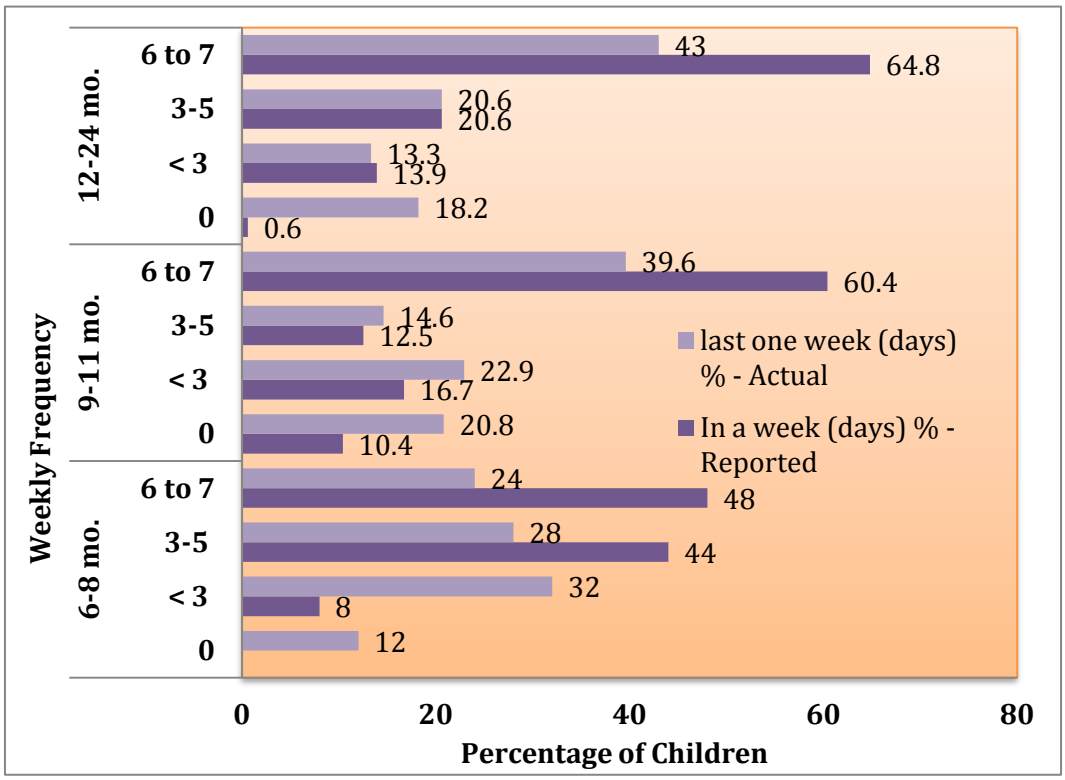
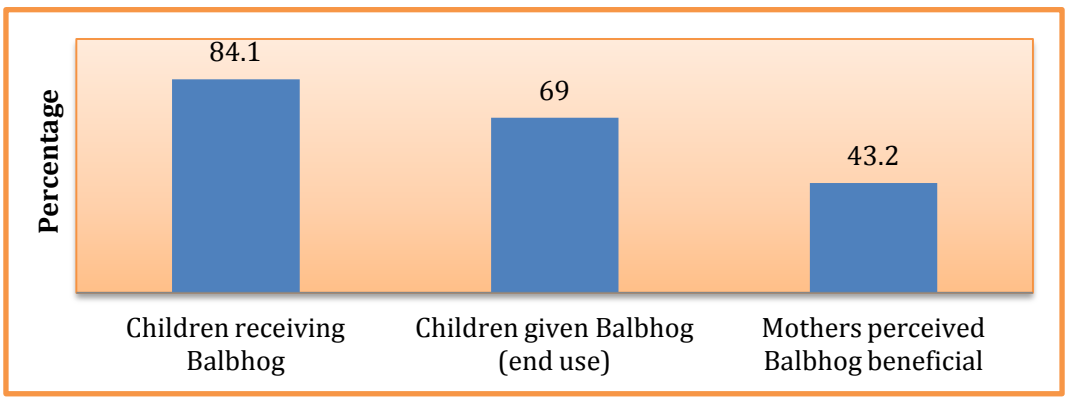


Figure I-10: Status of Utilization of *Balbhog* at Household level and perceived benefits by Parents (6-23 months) N=345



Discussion – Awareness and Utilization of Balbhog Supplementation

In the current study on examination of the access and utilization of *Balbhog*, which could have an impact on children's nutritional status, if consumed as expected, it was noted that the end use of *Balbhog* was 69% and the positive impact of *Balbhog* on child's health was perceived by less than 50% mothers of children (6-23 mo.).

Overall, around 83.6% children (6-23 mo.) were receiving *Balbhog* and 72.3% reported having received in the previous month. However, only around 55% reported

being counseled about the importance of *Balbhog* by the AWWs. This demonstrates the low contribution of AWWs in counseling and demand generation for *Balbhog*, which is specially very important for enhancing the feeding practices of children below 3 years.

However, the distribution of *Balbhog* reported in the current study was far better than the NFHS-3 survey. The NFHS-3 survey (2004-05) repoted that only 26.3% in India and 31.7% in Gujarat children under six years, receive supplementary nutrition through ICDS AWC. Simillarly, a field survey of four districts (Kutch, Panchamahal, Rajkot and Tapi) of Gujarat between 2009-10 showed that 62.4% children (6-23 mo.) were enrolled and given SNP under ICDS (www.sccommissioners.org 2010).

Status of Balbhog Distribution by Anganwadi Centers

The distribution of *Balbhog* was not conduced on *MAMTA DAY* after GMP and IYCF counselling. Most of the mother's (60.5%) reported that it was distributed as and when the stock arrived. Only 28.3% reported monthly and 38.3% reported having received *Balbhog* twice in a month. Further, only 3.2% reported having received *Balbhog* on *MAMTA DAY*.

The distribution of *Balbhog* on *MAMTA DAY* was lower than that reported in a study in Urban Vadodara. In the urban study, the exit interview of beneficiaries as they left *MAMTA DAY* after receiving services, showed that 82% children (6-36 mo.) received *Balbhog* (Kanani and Majumdar 2009).

In the current study, it was noted that monthly supply was usually distributed in parts. Majority of mothers (59.7%) reported receiving two packets, whereas not a single mother reported having received all 7 packets during her last reciept respectively.

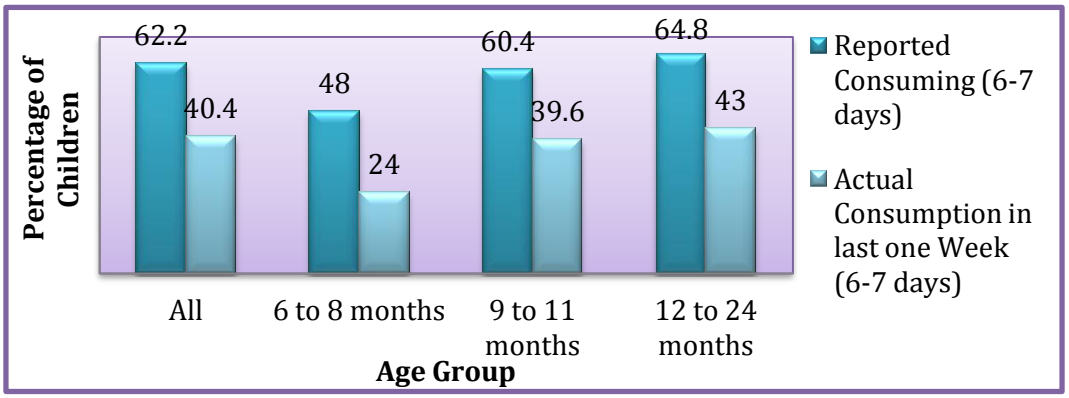
Household Utilization of Balbhog

Although 62.2% families stated that they give *Balbhog* to their children daily (6 to 7 days), only 40.4% families reported giving *Balbhog* for 6 to 7 days preceding the survey. The weekly frequency was higher among older age group (43%, 12-23 mo.) as compared to 24% among 6-8 months younger age group children (Figure I-11).

The compliance observed in the present study was better than reported in studies conducted earlier. A study by Sharma and Bhargav (2008), in urban slums of Vadodara (N=103, 6-36 mo.) showed the compliance of *Balbhog*, as 21.4% for >45 days, 57.2% between 6 to 44 days and 21.4% for<6 days, out of the 60 days studied. Another study by Sharma *et al.*, (2011) conducted in 2008 in a similar setting, showed the compliance of *Balbhog*, among children (6-23 mo.), as 15.6% for >=41

days, 56.3% between 6-40 days and 28.1% for <6 days out of 54 days studied. Thus the consumption of *Balbhog* was better in the current study as compared to that reported in 2008, in urban slums.

Figure I-11: Weekly Utilization of *Balbhog*



The two main reasons for not feeding *Balbhog among non compliant* were child disliking it (24/52) and child not eating anything (20/52). Similarly, Sharma and Thakkar (2008) reported the reasons for poor acceptability among some subjects due to dislike of taste, texture and appearance.

C. Nutritional Status of Children under Two years

The analysis of the nutritional status of children in this study is based on a new international reference population released by the WHO (Onis 2006) and accepted by the Government of India.

The following four standard indices of physical growth that describe the nutritional status of children are presented in the result:

1. Weight-for-age (underweight)
2. Height-for-age (stunting)
3. Weight-for-height (wasting)
4. Mid-Upper Arm Circumference –for– age

Each of the four nutritional status indicators is expressed in standard deviation (SD) units (Z-scores) from the median of the reference population. Each index provides different information about growth and body composition, which is used to assess the nutritional status.

Weight-for-age is a composite index of height-for-age and weight-for-height. It takes into account both acute and chronic malnutrition. Children whose weight-for-age Z-score (WAZ) is below -2SD and -3SD are classified as underweight and severely underweight respectively.

The height-for-age index is an indicator of linear growth retardation and cumulative growth deficits. The children whose height-for-age Z-score (HAZ) is below -2 SD is considered short for their age (stunted) and are chronically malnourished. Whereas, the children with HAZ below -3SD is considered to be severely stunted. Stunting reflects failure to receive adequate nutrition over a long period of time and is also affected by recurrent and chronic illnesses. Height-for-age, therefore, represents the long-term effects of malnutrition in a population and does not vary according to recent dietary intake.

The weight-for-height index measures body mass in relation to body length and describes current nutritional status. Children whose weight-for-height Z-score (WHZ) is below -2SD is considered thin (wasted) for their height and are acutely malnourished. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. Children whose WHZ is below -3SD is considered to be severely wasted and also categorized as having Severe Acute Malnutrition (SAM) (WHO 2007).

Mid-Upper Arm Circumference (MUAC) is relatively easy to measure and a good predictor of immediate risk of death. It is used for rapid screening of acute malnutrition from the 6-59 months age range. MUAC is recommended for assessing acute adult undernutrition and for estimating prevalence of undernutrition at the population level. Children whose MUAC is below -3SD are categorized as having Severe Acute Malnutrition (SAM) (WHO 2007).

The validity of these indices is determined by many factors, including the coverage of the population of children and the accuracy of the anthropometric measurements. In the current study the height, weight and MUAC data were collected in all the households having children below 2 years of age.

1. Profile of children covered

A total of 943 of 1229 children listed by AWWs, below 2 years of age were assessed for anthropometric measurements during baseline, approximately 50% from intervention group (IG) and control group (CG) respectively (Table I-51). Total 24% in IG and 22% in CG listed by AWWs, were not available at the time of survey, due to various reasons such as; out of station, migration, parents refused to allow weighing the child, critically ill, and missing date of birth. The ratio of male to female, and percent children covered in each age group, were comparable between IG and CG (Table I-51).

Table I-51: Profile of the Children Under Two Years Covered at Baseline

	Total	Intervention	Control
N	943	468 (49.6)	475 (50.4)
Sex			
– **Female**	433 (45.9)	213 (45.5)	220 (46.3)
– **Male**	510 (54.1)	255 (54.5)	255 (53.7)
$\chi 2$	0.06		
Age Group[9]			
• **0 to 5 mo**	249 (26.4)	130 (27.8)	119 (25.1)
• **6 to 11 mo.**	249 (26.4)	120 (25.6)	129 (27.2)
• **12 to 23 mo.**	445 (47.2)	218 (46.6)	227 (47.8)
$\chi 2$	0.94		

2. Prevalence of Undernutrition before Intervention

As shown in Table I-52, the prevalence of underweight (WAZ score <-2SD) was 48.8% among the surveyed populations (children 0-23 mo.). The prevalence of underweight was significantly higher and respective mean WAZ score were significantly ($p<0.05$) lower among males as compared to females by 6.6% points and 0.18 z-score respectively.

Overall, the prevalence of stunting (HAZ <-2SD) was 36.2%. Compared to females, stunting (HAZ <-2SD) was significantly higher and the mean HAZ score was significantly ($p<0.01$) lower among males, by 9.2% points and 0.05 z-score respectively. Also, the prevalence of severe stunting was significantly ($p<0.05$) higher among males (17.1%) as compared to the females (12.1%) by 41.3%.

The prevalence of wasting (WHZ score <-2SD) was 36.3%, and was similar to the prevalence of stunting (36.3%). Further, the prevalence of severe wasting, categorized as SAM was 11.7%, and the prevalence of severe wasting was higher among females (12.9%) as compared to males (10.7%).

Among children 6-23 months, the prevalence of MUACZ score <-2SD was 17%, whereas, the prevalence of SAM (MUACZ<-3SD) was 3%. The prevalence of SAM (MUACZ<-3SD) was higher among males by 40% as compared to females.

Overall, the prevalence of undernutrition was higher among males as compared to females, and the prevalence of underweight, stunting and severe stunting was significantly higher among males as compared to females.

[9] Age groups are described in intervals of months completed. For example, infants 0–5 months of age have completed 5 months but are less than 6 months (or 183 days) old.

Table I-52: Undernutrition Status of Children before Intervention

	Total	Female	Male	$\chi 2$	T values
% Weight-For-Age Score (WAZ Score)					
N	**937**	**429**	**508**		
Normal	51.2 (480)	54.8 (235)	48.2 (245)	3.998*	
% < -2SD[1]	48.8 (457)	45.2 (194)	51.8 (263)		
Mean ± SD	-1.96± 1.19	-1.87 ± 1.23	-2.05 ± 1.14		2.31*
%<-3SD	19(178)	18.9(81)	19.1(97)	0.007[NS]	
% Length/height-for-age (HAZ Score)					
N	**923**	**420**	**503**		
Normal	63.8 (589)	68.8 (289)	59.6 (300)	8.321**	
% < -2SD[1]	36.2 (334)	31.2 (131)	40.4 (203)		
Mean ± SD	-1.58± 1.37	-1.45 ± 1.33	-1.5 ± 1.23		2.63**
%<-3SD	14.8(137)	12.1(51)	17.1(86)	4.440*	
% Weight-for-length/height (WHZ Score)					
N	**929**	**425**	**504**		
Normal	63.7 (592)	64.7 (275)	62.9 (317)	0.326[NS]	
% < -2SD[1]	36.3 (337)	35.3 (150)	37.1 (187)		
Mean ± SD	-1.55 ± 1.2	-1.5 ± 1.23	-1.59 ± 1.17		1.08 [NS]
%<-3SD (SAM)	11.7 (109)	12.9(55)	10.7 (54)	1.102[NS]	
% Mid-upper arm circumference-for-age 6 to 23 months (MUACZ score)					
N	**689**	**314**	**375**		
Normal	83 (572)	84.1 (264)	82.1 (308)	0.457 [NS]	
% < -2SD[1]	17 (117)	15.9 (50)	17.9 (67)		
Mean ± SD	-1.06±1.05	-1.01±1.11	-1.10±0.99		-1.19 [NS]
%<-3SD (SAM)	3 (21)	2.5 (8)	3.5 (13)	0.487[NS]	

** Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001*

Note: Children over nourished were excluded from analysis.

** Total in each category may differ due to missing values.*

1 -2SD includes -3SD

2 Mantel Hansel Chi Square (likely hood ratio) used between males and females

All children below 2 years were divided into three age groups, primarily based on the recommended IYCF practices for prevention of undernutrition. Children 0-5 months, who are required to be EBF for prevention of undernutrition, formed the 1st age group. The 2nd age group included children 6-11 months, where in CF was recommended to be introduced on completion of 6 months. The 3rd age group covered children 12-23 months, where the recommendation to the care giver was to gradually introduce all homemade foods to the child and continues breastfeeding as well.

As presented in Table I-53, age-wise the prevalence of undernutrition was more among children in older groups. This higher prevalence of undernutrition and reduction in mean z-scores was significant for all anthropometric indices; underweight, stunting, wasting, and SAM.

The prevalence of underweight (WAZ<-2SD) increased by 7.2% and 15.4% point between children 0-6 months, 7-11 months and 12-23 months respectively. Age-wise the mean WAZ score were significantly ($p<0.001$) different. With regard to the prevalence of severe underweight (WAZ <-3SD), it was observed that, the prevalence of severe underweight was highest among older children (24.7%. 12-23 mo.) as compared to younger children (12.6%, 0-6 mo. and 15.3%, 6-11 mo.).

Comparing, the prevalence of stunting between the three age groups, the prevalence of stunting was 2.8 times more in older age group (12-23 mo.) as compared to younger age group (0-5 mo.). Also, the mean HAZ score differed significantly at $p<0.001$ and reduced as the age increased, by 1.07 z-score. The prevalence of severe stunting (HAZ<-3SD) increased by 15.1% points (6.3% to 21.4%) between the children in age group of 0-5 months and 12-23 months

Age-wise the prevalence of wasting (WAZ <2SD) increased by 7% points between the youngest (33.9%, 0-5 mo.) and the oldest (40.9%, 12-23 mo.) age group, and, difference in prevalence of wasting between the three age groups was statistically significant at $p<0.05$. However, the prevalence of wasting reduced by 3.5% point among children 6-11 months (30.4%) as compared to the younger children 0-5 months (33.9%). Table I-53 shows that the mean WAZ score between the three age groups was also statistically ($p<0.001$) different. Looking at the prevalence of severe wasting, also categorized as SAM, the prevalence of severe wasting was least among children 6-11 months (7.3%) as compared to the children 0-5 months (12.8%), and 12-23 months (13.6%).

The MUACZ score was calculated for children above 5 months. The prevalence of MUACZ<-2SD was 2 times higher among the older children (12-23 mo., 20.1%) as compared to the younger (6-11 mo., 11.4%) children. Overall, the mean MUACZ score was significantly ($p<0.001$) less by 0.36 z-score, among older (12-23 mo., -1.93) as compared to the younger (6-11 mo., -0.83) children. The prevalence of SAM (MUACZ<-3SD) was even greater in older children; the prevalence of SAM was 2.9 times more among the older (12-23 mo., 4.1%) as compared to the younger (6-11 mo., 1.2%) children. Thus the MUACZ score reduced and prevalence of SAM increased with advance in age.

Table I-53: Age-wise Prevalence of Undernutrition before Intervention

	0-5 mo.	6-11 mo.	12-23 mo.	$\chi 2$	T values
% Weight-For-Age (WAZ Score)					
N	**246**	**249**	**442**		
Normal	63.8 (157)	56.6 (141)	41.2 (182)	36.70***	
% < -2SD[1]	36.2 (89)	43.4 (108)	58.8 (260)		
Mean ± SD	-1.59 ± 1.180	-1.84 ± 1.165	-2.24 ± 1.135		42.23***
%<-3SD	12.6 (31)	15.3(38)	24.7(109)		
% Length/height-for-age (HAZ Score)					
N	**239**	**245**	**439**		
Normal	82.8 (198)	66.9 (164)	51.7 (227)	70.06 ***	
% < -2SD[1]	17.2 (41)	33.1 (81)	48.3 (212)		
Mean ± SD	-0.92 ± 1.309	-1.48 ± 1.217	-1.99 ± 1.326		90.56***
%<-3SD	6.3 (15)	11.4(28)	21.4(94)		
% Weight-for-length/height (WHZ Score)					
N	**242**	**247**	**440**		
Normal	66.1 (160)	69.6 (172)	59.1 (260)	8.46*	
% < -2SD[1]	33.9 (82)	30.4 (75)	40.9 (180)		
Mean ± SD	-1.42 ± 1.29	-1.34 ± 1.182	-1.74 ± 1.121		15.63***
%<-3SD (SAM)	12.8(31)	7.3(18)	13.6(60)		
% Mid-upper arm circumference-for-age 6 to 23 months (MUACZ score)					
N	**-**	**246**	**443**		
Normal	**-**	88.6 (218)	79.9 (354)	8.96**	
% < -2SD[1]	**-**	11.4 (28)	20.1 (89)		
Mean ± SD	**-**	-0.83 ± 1.00	-1.19 ± 1.06		4.43***
%<-3SD (SAM)	**-**	1.2(3)	4.1(18)		

** Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001*

***Note**: Children over nourished were excluded from analysis.*

Total in each category may differ due to missing values.

1 -2SD includes -3SD

2 Mantel Hansel Chi Square (likely hood ratio) used

Table I-54 shows the baseline prevalence of underweight among the intervention and control group. It was observed that overall; the prevalence of undernutrition was more in the IG compared to the CG despite randomization. In each group, prevalence of underweight was higher in males as compared to females.

Table I-55, shows the age-wise baseline prevalence of underweight among the IG and CG. It was observed that in both the groups the prevalence of underweight was higher among the older children as compared to the younger age group. The difference in prevalence of underweight between the age groups was statistically significant within both the groups' i.e. IG and CG. Comparing the mean WAZ score, it was observed that the mean WAZ score was lower among the older age groups as

compared to the younger age groups, in the IG and CG respectively. Also, the prevalence of severe underweight was higher among the older age group (12-23 mo.) in both the groups.

The baseline mean WHZ and MUACZ scores showed significant correlation between the IG and CG (Annexure 12).

Table I-54: Baseline Prevalence of Underweight among the Intervention and Control Group

	Intervention (IG)			Control (CG)		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
% Weight-For-Age (WAZ Score)						
N	**253**	**209**	**462**	**255**	**220**	**475**
Normal	42.3 (107)	54.1 (113)	47.6 (220)	54.1 (138)	55.5 (122)	54.7 (260)
% < -2SD	57.7 (146)	45.9 (96)	52.4 (242)	54.4 (117)	44.5 (98)	45.3 (215)
χ^2	6.36*			0.09 NS		
Mean ± SD	-2.14± 1.18	-1.90± 1.26	-2.03± 1.22	-1.95± 1.09	-1.83± 1.21	-1.90± 1.15
T values	2.14*			1.08 NS		

** Significant at p<0.05* *** Significant at p<0.01* **** Significant at p<0.001*

Note: <*-2SD* include <*-3SD*

Table I-55: Baseline Prevalence of Underweight among the Intervention and Control Group

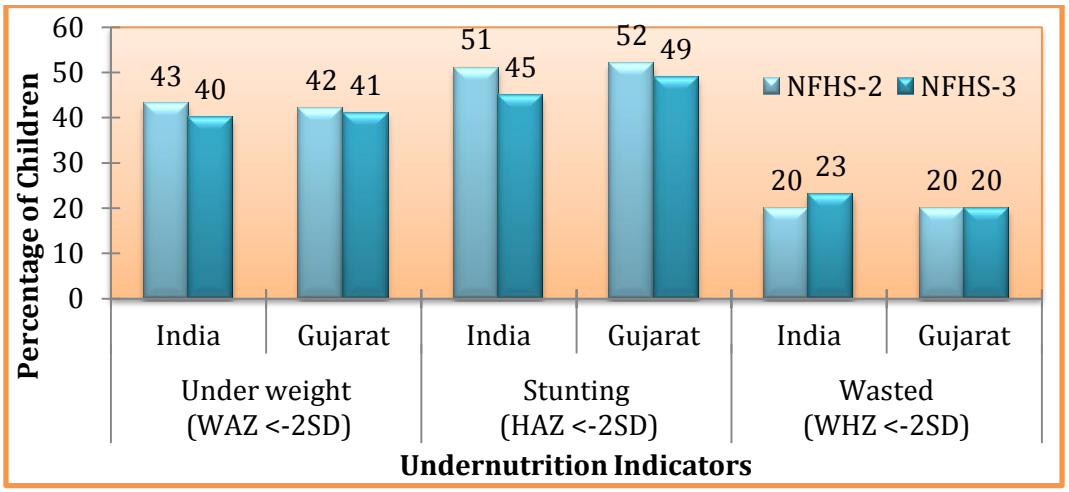
% Weight-For-Age Score (WAZ)	**0-5 mo.**	**6-11 mo.**	**12-23 mo.**	**Total**
	Intervention (IG) % (N)			
Total	**127**	**120**	**215**	**462**
Normal	63 (80)	59.2 (71)	32.1 (69)	47.6 (220)
% <-2SD	37 (47)	40.8 (49)	67.9 (146)	52.4 (242)
χ^2	39.226 ***			
Mean ± SD	-1.56±1.25	-1.86±1.13	-2.41±1.15	-2.03 ± 1.22
% <-3SD	15 (19)	15.8 (19)	28.4 (61)	21.4 (99)
	Control (CG) % (N)			
Total	**119**	**129**	**227**	**475**
Normal	64.7 (77)	54.3 (70)	49.8 (113)	54.7 (260)
% <-2SD	35.3 (42)	45.7 (59)	50.2 (114)	45.3 (215)
χ^2	7.037*			
Mean ± SD	-1.62±1.11	-1.82±1.20	-2.07±1.11	-1.83 ±1.21
% <-3SD	10.1 (12)	14.7 (19)	21.1 (48)	16.6 (79)

** Significant at p<0.05* *** Significant at p<0.01* **** Significant at p<0.001*

Discussion: Nutritional Status of Children Under Two years

In the current study, overall the prevalence of underweight was highest (48.8%), followed by almost similar prevalence of wasting (36.3%), and stunting (36.2%). As compared with the NFHS-3 survey (Figure I-12), for India and Gujarat, the prevalence of underweight and wasting was higher in the current study area, whereas the prevalence of stunting was comparatively less (NFHS-3 2007). Also, a study in urban Allahabad showed similar results as compared to the NFHS-3 survey; 36.4% underweight, 51.6% stunted and 10.6% wasted (Kumar *et al.* 2006).

Figure I-12: Prevalence of Undernutrition in India and Gujarat (0-23 months)

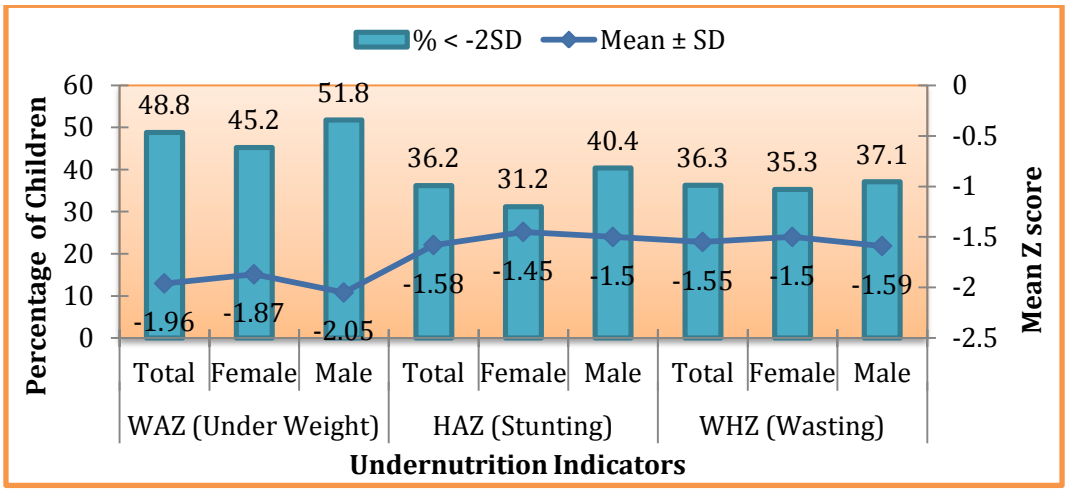


Sharma and Bhargava (2008) reported a comparative higher prevalence of undernutrition in urban slums of Vadodara; almost 82% children (6-36 mo.) were underweight, 47% wasted and 81% stunted. Also, a study by Daxini and Kanani (2009), in rural Vadodara reported higher prevalence of underweight (64.9%) and stunting (70%) as compared to the current study, whereas the prevalence of wasting was lower (28.3%). The difference could be since, the areas of assessment were different within the same district; the current study had a predominant semi tribal population, whereas the study population in the studies by Sharma *and* Bhargava and Daxini *and* Kanani were from urban and rural Vadodara, respectively.

In the current study, the prevalence of undernutrition was higher in males as compared to females. The prevalence of underweight and stunting was significantly higher in males as compared to the females (Figure I-13). The NFHS-3 survey for Gujarat showed, that boys (below five years) were marginally more underweight (46.6%) as compared to girls (42.4%), whereas, with reference to stunting (52%) and

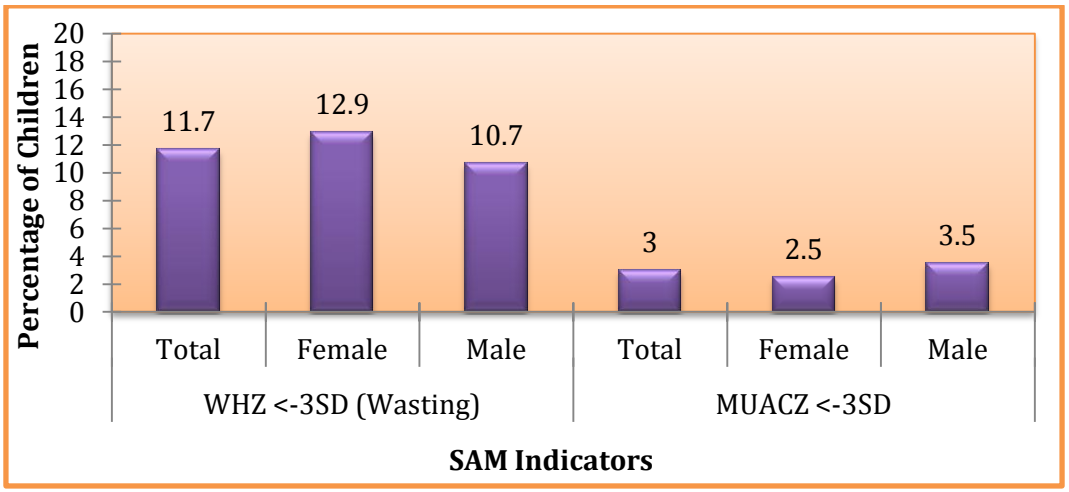
wasting (19%) the prevalence was almost similar between boys and girls (NFHS-3 Gujarat 2008).

Figure I-13: Baseline Prevalence of Undernutrition in Children (0-23 months)



In the current study, with reference to the prevalence of severe undernutrition, the prevalence was higher among males as compared to females, except for the prevalence of wasting. And, with reference to the prevalence of SAM, the prevalence of severe wasting was higher in females, whereas prevalence of SAM (MUACZ<-3SD) was higher in males (Figure I-14).

Figure I-14: Baseline Prevalence of SAM among Children (0-23 months)



Except for the prevalence of severe wasting, which was higher among girls, the NHFS-3 survey for Gujarat showed similar status. The prevalence of severe stunting was more in boys (28.1%) as compared to girls (22.6%), whereas the prevalence of severe wasting and undernutrition was marginally more in girls (NHFS-3 Gujarat, 2008).

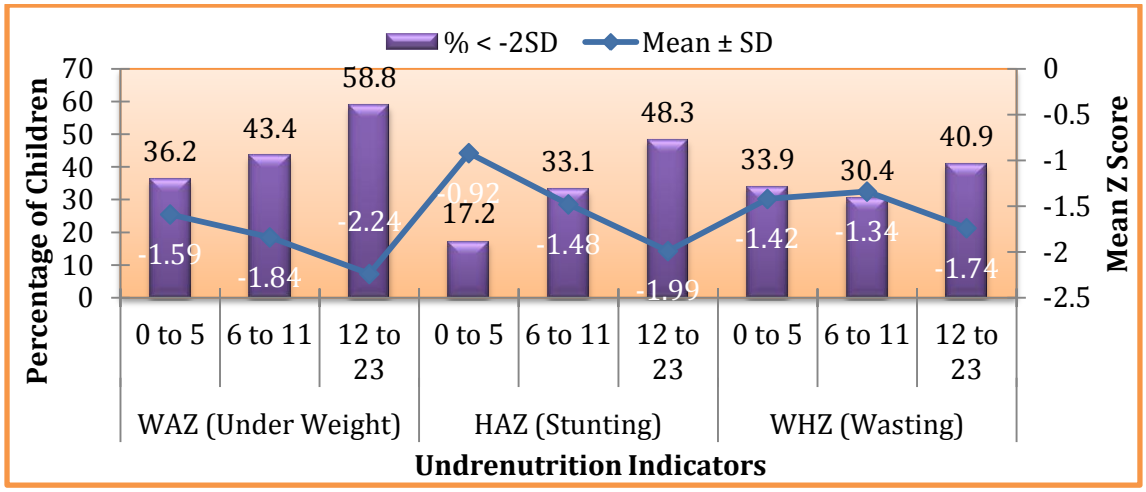
Not many studies are available which have used MUAC for assessment of undernutrition. A study conducted in Bangladesh showed that 22.2% children 12-17 months and 20.8% children 28-23 months had MUACZ<-3 SD (Roy 2011). This was very much higher than the current study where 3% children had MUACZ<-3 SD

A study in urban slums of Delhi showed that the mean MUAC in children 9-36 months (N=545) was 12.7cm±1.03 SD. The mean MUAC for boys and girls was 12.9cm±0.9 and 12.5cm±1.1 respectively (Kapur *et al.* 2005). In current study, the means MUAC score were higher, the overall (N=691) mean MUAC score was 13.42cm±1.12, and for males and females was 13.55cm±1.05 and 13.26cm±1.19 respectively.

In the current study, the age-wise analysis showed that, the prevalence of undernutrition was higher among older (6-11 mo. and 12-23 mo.) as compared to the younger (0–5 mo.) age group (Figure I-15). Between the age groups, the difference in prevalence and mean z-score was significant for all anthropometric indices underweight, stunting, wasting, and SAM.

Also, in the current study, the prevalence of undernutrition was highest among children in the age group of 12-23 months (58.8%) as compared to other age groups, overall undernutrition (48.8%) as well as, sex-wise prevalence of undernutrition.

Figure I-15: Age-wise Prevalence of Undernutrition among Children 0-23 months



The NFHS-3 survey (2005-06) also showed that during the first 6 months of life, when most babies are breastfed, 20-30% of children are undernourished according to the three nutritional indices (NFHS-3 2007). Further, the NFHS-3 survey for Gujarat reported stunting, wasting and underweight, among children under 6 months, as 19.8%, 20.7% and 23.1% respectively (NFHS-3 Gujarat 2008). This was lower than the current study, where 17-36% children were undernourished (Figure I-15).

Also, a study in urban Allahabad showed that the proportions of underweight (45.5%) and stunting (81.8%) were found maximum among children aged 13–24 months, whereas, wasting was most prevalent (18.2%) among children 37–48 months (Kumar *et al.* 2006). Daxini and Kanani (2009) also showed that, in rural Vadodara, the prevalence of undernutrition increase significantly with the increase in age from 6-11 months, 12-23 months and 24-35 months.

The NHFS-3 survey showed that the prevalence of severe wasting among children under five years of age was 6.4% and 5.8% in India and Gujarat respectively. The prevalence of severe wasting in Gujarat reduced from 9.1% among children < 6 months to 7.5% among 12-23 months However, in the current study, no such reduction in severe wasting was noted, between children 0-6 months (12.8%), 6-11 months (7.3%) and 12-23 months (13.6%)

Undernutrition is prominent among children in the age group of 12-23 months, when many children are started on complementary feeding.The NFHS-3 survey showed that in Gujarat around 30% of children are severely stunted, 13.6% are severely wasted and 24.7% are severely underweight. However, in the current study, severe stunting was lower (21.4%), and severe wasting (13.6%) and severe underweight (24.7%) was higher in this age group (12-23 mo.).

D. Factors Affecting the Nutritional Status of Children Under Two Years

The causes of malnutrition in children are generally complex and include biological, social and environmental factors. This section describes the association of undernutrition in children with socio economic status (SES), maternal and child characteristics including birth weight and morbidity; hygiene and sanitation; IYCF practices and utilization of ICDS services for children below 2 years.

1. Household, Mother and Child Background Characteristics

a) *Socio Economic Status*

As presented in Table I-56, the prevalence of underweight (61.1%, OR 1.88) and stunting (38.5%, OR 1.31) was highest among the lower SES. Also, the odds of underweight and wasting were statistically significant in lower SES group as compared to the upper lower SES group.

Similarly, the prevalence of stunting and underweight was significantly higher among ST and OBC as compared to the general caste. The highest prevalence of

undernutrition was among the ST caste followed by OBC. The odds of being undernourished were higher in ST and OBC for all the three undernutrition criteria, whereas for SC, the odds of being stunted and underweight were higher than the general caste which was the reference categories. Overall a strong association between SES status, caste and undernutrition was noted.

The univariate analysis showed significant correlation between the mean z-score of all four nutritional indices and SES scales. Significant correlation between the mean HAZ and WAZ z-score and caste was also noted, whereas with the WHZ and MUAC only the independent 't' test between the mean z score were statistically significant (Annexure 12).

Table I-56: Association of Socio Economic Status with Undernutrition in Children

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Wealth Index Kuppuswamy's Socioeconomic Status Scale, 2007						
– Upper Middle	(0/2)	NA	(0/3)	NA	(0/2)	NA
– Lower Middle	58.3 (7/12)	2.77^{NS} (0.86-8.89)	27.3 (3/11)	0.78^{NS} (0.20-2.99)	33.3 (4/12)	0.6 ^{NS} (0.18-2.02)
– Upper lower (RC)	33.6 (137/408)	1.00	32.4 (132/407)	1.00	45.5 (187/411)	1.00
– Lower	46.2 (49/106)	1.70* (1.10-2.62)	38.5 (42/109)	1.31 ^{NS} (0.84-2.02)	61.1 (66/108)	1.88** (1.22-2.90)
Total	**36.6(193/528)**		**33.4(177/530)**		**48.2(257/533)**	
Caste						
– General (RC)	31.7 (20/63)	1.00	11.5 (7/61)	1.00	22.2 (14/63)	1.00
– SC	16.0 (4/25)	0.41^{NS} (0.12-1.35)	23.1 (6/26)	2.31^{NS} (0.69-7.72)	32.0 (8/25)	1.65^{NS} (0.59-4.61)
– ST	42.9 (90/210)	1.61^{NS} (0.89-2.93)	42.5 (91/214)	5.71*** (2.48-13.12)	58.4 (125/214)	4.92*** (2.59-9.45)
– OBC	33.3 (89/267)	1.08^{NS} (0.60 – 1.94)	32.2 (85/264)	3.66** (1.60-8.39)	47.4 (127/268)	3.15*** (1.66-5.98)
Total	**35.9(203/565)**		**33.5(189/565)**		**48.1(274/570)**	

*RC = Reference Category with OR=1.00; * Significant at p<0.05, ** Significant at p<0.01, *** Significant at p<0.001; Total may be different due to missing values*

b) *Household Water, Sanitation condition and Hand-washing Practices*

The World Health Organization (WHO) data on the burden of disease suggests that approximately 3.2% of deaths (1.8 million) and 4.2% of disability-adjusted-life years (61.9 million) worldwide are attributable to unsafe water, sanitation and hygiene (WHO 2004a). Of all deaths attributable to water, sanitation and hygiene, over 99.8% occur in developing countries, and 90% are of children. WHO/UNICEF acknowledge that the 5.2 billion people who use an "improved" water source nevertheless drink water which is unsafe, following contamination at source, in the piped distribution system or as a result of unhygienic handling during transport or in the home (WHO 2004b).

In the present study, no association between the source of drinking water and undernutrition could be assessed, due to very small number of children (9/564) having access to unsafe sources of drinking water like well; unprotected dug well.

The prevalence and odds of undernutrition was higher among children in households with unsafe and partially safe stored drinking water, as well as, with unsafe practice of drawing water from the container (e.g. pot). However, as presented in Table I-57, only, the prevalence of wasting (OR 1.72) was significantly higher ($p<0.01$) with reference to unsafe practice of drawing water from the container.

Lastly, as presented in Table I-57, although the prevalence of undernutrition was higher in children not practicing hand-washing before eating, the association was not statistically significant.

Univariate analysis showed significant correlation between mean WHZ score of the children and the safety of drawing drinking water from the container (Annexure 12).

With reference to use of sanitation facility in the household, the odds and prevalence of underweight (50.3%, OR 1.64) and stunting (35.7%, OR 1.73) was significantly higher ($p<0.05$) among children without access to household toilet facility (Table I-58). Similarly defecation in open was also significantly associated with prevalence of stunting and underweight.

Univariate analysis showed significant correlation between mean WAZ score *and* HAZ score of the children among those having access and using household toilet (Annexure 12).

Table I-57: Association of Household Water and Hand-washing Practices with Undernutrition in Children

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Storage of Drinking Water (Container Covered And Kept On High Platform						
– Partial Safe	43.6 (48/110)	1.49 NS (0.98-2.29)	36.6 (41/112)	1.19 NS (0.77-1.84)	50.9 (57/112)	1.17 NS (0.77-1.78)
– Safe (RC)	34.1 (144/422)	1.00	32.7 (137/419)	1.00	46.9 (199/424)	1.00
– Unsafe	66.7 (2/3)	3.86 NS (0.35–42.94)	33.3 (1/3)	undefined	66.7 (2/3)	2.26 NS (0.20-25.13)
Total	**36.3 (194/535)**		**33.5 (179/534)**		**47.9 (258/539)**	
Safety of drawing drinking water from the container						
– Safe (RC)	31.3 (103/329)	1.00	33.6 (111/330)	1.00	46.2 (152/329)	1.00
– Unsafe	44.0 (88/200)	1.72** (1.20-2.48)	34.7 (69/199)	1.05 NS (0.72-1.52)	50.5 (103/204)	1.19 NS (0.84-1.68)
Total	**36.1(191/529)**		**34.0(180/529)**		**47.8 (255/533)**	
Hand-washing by children before eating						
– No	43.1 (25/58)	1.33 NS (0.74-2.36)	44.1 (26/59)	1.00 NS (0.57-1.77)	59.3 (35/59)	1.15 NS (0.65-2.05)
– Yes (RC)	36.4 (96/264)	1.00	44.0 (117/266)	1.00	55.8 (148/265)	1.00
Total	**37.6 (121/322)**		**44.0 (143/325)**		**56.5 (183/324)**	

*RC = Reference Category with OR=1.00; * Significant at p<0.05, ** Significant at p<0.01, *** Significant at p<0.001; Total may be different due to missing values*

Table I-58: Association of Sanitation Facility and Use with Undernutrition in Children

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Children Having Access and Using Household Toilet						
– No	37.2 (168/452)	1.32NS (0.85-2.07)	35.7 (161/451)	1.73* (1.07-2.78)	50.3 (230/457)	1.64* (1.07-2.51)
– Yes (RC)	30.9 (34/110)	1.00	24.3 (27/111)	1.00	38.2 (42/110)	1.00
Total	**35.9 (202/562)**		**33.5 (188/562)**		**48.0 (272/567)**	

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
Household Toilet Usage						
– Open	36.5 (161/ 441)	1.32 NS (0.84-2.08)	36.3 (160/ 441)	1.84* (1.14-2.98)	50.0 (223/ 446)	1.66* (1.08-2.55)
– Household (RC)	30.3 (33/109)	1.00	23.6 (26/110)	1.00	37.6 (41/109)	1.00
– Community	66.7 (2/3)	4.62NS (0.40-52.58)	50.0 (1/2)	Undefined	33.3 (1/3)	0.83 NS (0.07-9.43)
Total	**35.4 (196/553)**		**33.8 (187/553)**		**47.5 (265/558)**	

*RC = Reference Category with OR=1.00; * Significant at p<0.05, ** Significant at p<0.01, *** Significant at p<0.001; Total may be different due to missing values*

c) *Background characteristics of Mother*

When compared with mother's age, the prevalence of underweight and wasting among children was highest among mothers in the age group of 26-30 years.

Table I-59 shows that mothers' education and occupation also demonstrate association with undernutrition; Literate mothers and non working mothers had low prevalence of undernutrition as compared to, illiterate mothers, working mothers and mothers into unskilled or skilled occupation.

Overall, among all mothers, the mother's with unskilled occupation had highest underweight (75% and OR=3.36) and stunted (75% and OR=6.23) children. Wasting was highest among the children of working mothers with unskilled, skilled or semi-skilled occupation (50% and OR=1.76).

The mean WAZ, HAZ and MUACZ score of the children significantly associated with mother's education, and the mean WAZ and HAZ score significantly associated with mother's occupation (Annexure 12).

Table I-59: Association of Mother's, Background Characteristics with Undernutrition in Children

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Mother's Age						
– =<20	30.9 (25/81)	0.80 NS (0.47-1.35)	31.3 (25/80)	0.89 NS (0.52-1.50)	44.4 (36/81)	0.85 NS (0.52-1.39)
– 21-25 (RC)	35.9 (111/309)	1.00	33.9 (105/310)	1.00	48.4 (151/312)	1.00

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
– 26-30	41.4 (46/111)	1.23 NS (0.79-1.93)	30.3 (33/109)	0.85 NS (0.53-1.36)	49.1 (55/112)	1.02 NS (0.69-1.58)
– >=31	26.9 (7/26)	0.65 NS (0.27-1.61)	32.1 (9/28)	0.92 NS (0.40-2.12)	37.0 (10/27)	0.63 NS (0.28-1.41)
Total	**35.9 (189/527)**		**32.6 (172/527)**		**47.4 (252/532)**	
Mother's Education						
– Illiterate	41.1 (62/151)	1.58 NS (0.96-2.58)	41.1 (62/151)	1.64* (1.00-2.68)	58.8 (90/153)	2.12 ** (1.32-3.39)
– Primary school	35.3 (90/255)	1.24 NS (0.79-1.93)	33.1 (84/254)	1.16 NS (0.74-1.83)	46.1 (119/258)	1.27 NS (0.83-1.94)
– Middle school(RC)	30.6 (41/134)	1.00 NS	29.9 (40/134)	1.00	40.3 (54/134)	1.00
– High school	41.2 (7/17)	1.59NS (0.56-4.4)	11.1 (2/18)	0.29NS (0.06-1.34)	47.1 (8/17)	1.32NS (0.48-3.63)
– Graduate or post graduate	42.9 (3/7)	1.70 NS (0.36-7.95)	0.0 (0/7)	NA	28.6 (2/7)	0.59 NS (0.11-3.17)
Total	**36.0 (203/564)**		**33.3 (188/564)**		**48.0 (273/569)**	
Mother's Occupation						
– Unemployed (RC)	36.2 (188/519)	1.00	32.5 (169/520)	1.00	47.1 (247/524)	1.00
– Unskilled worker	50.0 (2/4)	1.76 NS (0.25-2.60)	75.0 (3/4)	6.23 NS (0.64-60.35)	75.0 (3/4)	3.36 NS (0.35-32.55)
– Skilled worker	50.0 (7/14)	1.76 NS (0.61-5.10)	69.2 (9/13)	4.67NS (1.42-15.39)	71.4 (10/14)	2.80 NS (0.87-9.05)
– Semi-skilled worker	50.0 (2/4)	1.76 NS (0.25-2.60)	0.0 (0/4)	NA	50.0 (2/4)	1.12 NS (0.16-8.02)
– Clerical, Shop-owner, Farmer	9.1 (1/11)	0.18 NS (0.02-1.39)	36.4 (4/11)	1.87 NS (0.34-4.11)	45.5 (5/11)	0.93 NS (0.28-3.10)
Total	**36.2 (200/552)**		**33.5 (185/552)**		**47.9 (267/557)**	

*RC = Reference Category with OR=1.00; * Significant at p<0.05, ** Significant at p<0.01, *** Significant at p<0.001; Total may be different due to missing values*

d) *Background characteristics of Child*

Among the direct factors sex, age of the child and birth weight were found to be significantly associated with undernutrition in children.

For factors like sex, age and birth weight of the child the study findings show that, male children had higher odds of being undernourished. The prevalence and odds of being stunted (OR 1.49, p<0.01) and wasted (OR 1.30, p<0.05) was significantly higher among males. Also, the prevalence of undernutrition increased with increase in age. The prevalence and odds of stunting (OR 4.51, p<0.001) and wasting (OR 2.52, p<0.001) were significantly higher in older children (12-23 mo.). Among children in the age group of 6-11 months, only, the odds of stunting (OR 2.30, p<0.001) was significantly higher.

Low birth weight (LBW<2500gms) also showed a strong association with growth failure in children. The analysis shows that the children who were born with LBW were 30.4% more underweight, 7.1% more stunted and 8.8% more wasted as compared to children with birth weight ≥2500 gm. The prevalence and odds of being underweight (OR 2.83, p<0.001) and wasted (OR 1.97, p<0.01) was significantly higher among LBW.

Relating childhood morbidity and undernutrition, it was noted that children with diarrhea, 15 days preceding the survey, had significant higher prevalence and odds of wasting (OR 1.85, p<0.05). The odds of underweight (OR 1.53) and stunting (OR 1.48) were also higher in children who suffer from diarrhea. No strong association was reported between undernutrition and fever or coughs, except for significant lower odds of stunting among those who suffered from cough (Table I-60).

Associating children's background characteristics with mean z-score, the age of children and diarrhea morbidity significantly correlated with all four mean z-score of nutritional indices. Similarly, sex of child and LBW significantly correlated with mean WAZ and HAZ mean z-score (Annexure 12).

Table I-60: Association of Child Background Characteristics with Undernutrition in Children

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Child Sex						
– Male	51.8 (263/508)	1.30* (1.00-1.68)	40.4 (203/503)	1.49** (1.14-1.96)	37.1 (187/504)	1.08^{ns} (0.83-1.42)
– Female (RC)	45.2 (194/429)	1.00	31.2 (131/420)	1.00	35.3 (150/425)	1.00
Total	**48.8 (457/937)**		**36.2 (334/923)**		**36.3 (337/929)**	

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Age Group of Child (months)						
– 0-5 (RC)	36.2 (89/246)	1.00	17.2 (41/239)	1.00	33.9 (82/242)	1.00
– 6-11	43.4 (108/249)	1.35^{NS} (0.94-1.94)	33.1 (81/245)	2.39*** (1.55-3.66)	30.4 (75/247)	0.85^{NS} (0.58-1.25)
– 12-23	58.8 (260/442)	2.52 *** (1.83-3.48)	48.3 (212/439)	4.51*** (3.07-6.63)	40.9 (180/440)	1.35 ^{ns} (0.97-1.87)
Total	**48.8 (457/937)**		**36.2 (334/923)**		**36.3 (337/929)**	
Birth Weight						
– LBW	40.4 (44/109)	1.97* (1.03–3.80)	36.0 (40/111)	1.01^{NS} (0.51–2.02)	64.9 (72/111)	2.83*** (1.80–4.40)
– Normal (RC)	31.6 (106/335)	1.00	28.9 (96/332)	1.00	39.5 (133/337)	1.00
Total	**36.0 (204/566)**		**33.5 (190/567)**		**48.3 (276/572)**	
Diarrhea						
– Yes	48.1 (39/81)	1.85* (1.15-2.97)	41.5 (34/82)	1.48^{NS} (0.91-2.38)	57.3 (47/82)	1.53^{NS} (0.96-2.46)
– No (RC)	33.5 (161/481)	1.00	32.4 (156/481)	1.00	46.7 (227/486)	1.00
Total	**35.6 (200/562)**		**33.7 (190/563)**		**48.2 (274/568)**	
Fever						
• Yes	39.3 (33/84)	1.19^{NS} (0.74-1.92)	32.1 (27/84)	0.92^{NS} (0.56-1.51)	50.6 (43/85)	1.11^{NS} (0.70-1.76)
• No (RC)	35.1 (1684/78)	1.00	34.0 (163/479)	1.00	48.0 (232/483)	1.00
Total	**35.8 (201/562)**		**33.7 (190/563)**		**48.4 (275/568)**	
Cough						
• Yes	33.8 (50/148)	0.89^{NS} (0.60-1.32)	26.7 (39/146)	0.64* (0.42-0.97)	43.0 (64/149)	0.74^{NS} (0.51-1.08)
• No (RC)	36.5 (151/414)	1.00	36.2 (151/417)	1.00	50.4 (211/419)	1.00
Total	**35.8 (201/562)**		**33.7 (190/563)**		**48.4 (275/568)**	

*RC = Reference Category with OR=1.00; * Significant at p<0.05, ** Significant at p<0.01, *** Significant at p<0.001; Total may be different due to missing values*

2. Infant and Young Child Feeding Practices

Table I-61 presents the association of three key IYCF practices i.e. early initiation of breastfeeding within one hour of birth, EBF till 6 months, and introduction of CF from 6th months onwards, with undernutrition.

EIBF showed a positive association with wasting and underweight. The children who had EIBF had 3.6% point lower prevalence of wasting and 10.8% point lower prevalence of underweight as compared to non EIBF children. The odds of wasting (OR 1.18) and underweight (OR 1.59) was also higher in children who did not have EIBF. However the prevalence and odds of stunting was lower in non EIBF as compared to EIBF. The difference in prevalence of undernutrition was statistically non-significant for all the three undernutrition indicators. The association was similar for children with normal and caesarian delivery.

EBF did not show a strong association with undernutrition. Also, due to very small number of children being non-breastfed, no conclusion could be drawn, regarding non-breastfeeding and association of undernutrition in children.

Lastly, the children who were introduced CF at 6-8 months were comparatively less undernourished as compared to, those who were introduced CF between 9-18 months, as well as, all those who were not introduced CF between 6-8 months. Also, the odds of being undernourished were also less among those who were introduced CF between 6-8 months, but the difference in prevalence was statistically non-significant.

Further, there was a significant correlation between EIBF (Normal delivery) and MUACZ (0.141, $p<0.05$) and EIBF (among all delivery type) and WHZ (0.108, $p<0.05$). No other IYCF indicator significantly correlated with undernutrition.

Among the three IYCF indicators, EIBF significantly correlated with mean WHZ score of children, whereas the independent't' test between the mean WHZ score were statistically significant for EBF (Annexure 12).

Table I-61: Association of Infant and Young Child Feeding Practices With Undernutrition

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Early initiation of breastfeeding (Normal delivery) (0-12 months)						
– Yes (RC)	31.3 (71/227)	1.00	24.6 (55/224)	1.00	36.8 (84/228)	1.00

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
– No	34.9 (29/83)	1.18 NS (0.69-2.00)	21.7 (18/83)	0.85 NS (0.47-1.56)	47.6 (40/84)	1.59 NS (0.94-2.58)
Total	**32.3(100/310)**		**23.8(73/307)**		**39.7(124/312)**	
Early initiation of breastfeeding (C-section) (0-12 months)						
– Yes (RC)	25.0 (3/12)	1.00	23.1 (3/13)	1.00	33.3 (4/12)	1.00
– No	41.2 (7/17)	2.10 NS (0.41-10.6)	12.5 (2/16)	0.48 NS (0.07-3.40)	38.9 (7/18)	1.27 NS (0.28-5.88)
Total	**34.5(10/29)**		**17.2(5/29)**		**36.7(11/30)**	
Exclusive Breastfeeding (0-6 months)						
– Non Breastfed (a)	100.0 (2/2)	undefined	25.0 (1/4)	1.56 NS (0.15-16.27)	100.0 (4/4)	undefined
– Yes (RC)	48.6 (34/70)	1.00	17.6 (12/68)	1.00	35.2 (25/71)	1.00
– No (b)	26.4 (39/148)	0.38** (0.21-0.69)	17.7 (26/147)	1.00 NS (0.47-2.13)	36.2 (54/149)	1.05 NS (0.58-1.89)
Total	**34.1 (75/220)**		**17.8 (39/219)**		**37.1 (83/224)**	
– No (a+b)	27.3 (41/150)	0.22** (0.22-0.72)	17.9 (27/151)	1.01 NS (0.48-2.15)	37.9 (58/153)	1.07 NS (0.67-1.71)
Introduction of semi solid food (6-23 months)						
– 6 - 8 mo. (RC)	35.4 (73/206)	1.00	43.5 (90/207)	1.00	55.3 (114/206)	1.00
– 9 to 18 mo.	49.2 (30/61)	1.76 NS (0.99-3.14)	50.0 (31/62)	1.30 NS (0.74-2.30)	64.5 (40/62)	1.47 NS (0.81-2.64)
Total	**38.6 (103/267)**		**45.0 (121/269)**		**57.5 (154/268)**	
Introduction of semi solid food at 6 –8 months (6-23 months)						
– Yes (RC)	35.4 (73/206)	1.00	43.5 (90/207)	1.00	55.3 (114/206)	1.00
– No	39.4 (54/137)	1.19 NS (0.76-1.85)	43.2 (60/139)	0.99 NS (0.64-1.52)	55.4 (77/139)	1.00 NS (0.65-1.55)
Total	**37.0 (127/343)**		**43.4 (150/346)**		**55.4 (191/345)**	

*RC = Reference Category with OR=1.00; * Significant at p<0.05, ** Significant at p<0.01, *** Significant at p<0.001; Total may be different due to missing values*

When multiple regression analysis was done taking WAZ, WHZ, HAZ and MUACZ as the dependent variable individually and including EIBF as one of the independent variable among children 0-12 months, five factors were found to exert an

independent effect at different stages i.e. LBW (WAZ 1st, HAZ 1st), caste (WAZ, HAZ), age of child in months (HAZ, MUACZ 1st), safety of drawing drinking water from the container (WHZ 1st, MUACZ), history of diarrhea in last 15 days (MUACZ) and sex of child (WAZ).

Further, assessing the respective z-scores as dependent variable including EBF as one of the independent variable among children 0-6 mo, except for LBW which entered first for WAZ and HAZ, 7 more factors were found to exert an independent effect at different stages, however none of them were found to exert effect for more than one Z-score. The 7 factors were wealth index kuppuswamy's socioeconomic status scale, 2007 (WAZ), age in months of child (WHZ 1st), safety of drawing drinking water from the container (WHZ), mothers' age group (WHZ), caste (HAZ), history of diarrhea in last 15 days (MUACZ 1st) and mother's occupation (MUACZ) .

Finally, with CF as one of the independent variable among children 6-23 months, 8 factors were found to exert an independent effect at different stages. Caste of child entered for WAZ at 1st place, as well as for WHZ and HAZ. The factors which entered for any two z-scores were safety of drawing drinking water from the container (WHZ 1st, WAZ), storage of drinking water (WAZ, HAZ 1st), Age of child in months (WAZ, WHZ) and *Balbhog* consumed in 24 hours preceding the survey (WAZ, HAZ). The remaining three factors entered for one z-score each, i.e. history of cough in last 15 days (HAZ), mother's education (HAZ) and mother's age (MUAC 1st).

3. Utilization of ICDS services for children under two years

Among the ICDS related factors, growth monitoring and promotion (GMP), *MAMTA DAY* participation and use of *Balbhog* were the three factors which were studied in association with undernutrition (Table I-62).

The participation of children in monthly GMP was associated with prevalence of undernutrition. The data showed that, the children who were not weighed in last 2 months preceding the survey were more undernourished as compared to those who were regularly weighed (i.e. weighed within last 2 mo.). The odds of being undernourished were also greater for children not weighed in the last 2 months (60 days preceding the survey). Also, the association of stunting and GMP was statistically significant ($p<0.05$).

The prevalence of undernutrition and odds was also higher among children who did not attend *MAMTA DAY* regularly. Prevalence of underweight was more by 6.2% points, stunting was greater by 12.1% points and wasting was greater by 5.8%

points, among children who did not attend *MAMTA DAY* held preceding the survey. Also, the difference in prevalence of stunting was statistically significant (p<0.01).

As presented in Table I-62, no association of undernutrition with *Balbhog* consumption among children (6-23 mo.) was noted.

The children weighed in the previous month significantly correlated with mean WHZ and MUACZ score. With reference to *MAMTA DAY* participation, there was a significant correlation between the mean WAZ, HAZ and MUACZ score (Annexure 12).

Table I-62: Association of ICDS Service Utilization with Undernutrition

Indicators	WHZ <-2SD Wasting		HAZ <-2SD Stunting		WAZ <-2SD Underweight	
	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)	% (N)	Un-adjusted OR (CI)
Growth Monitoring Frequency						
Last GMP done (months back)						
– 0 (RC)	34.5 (135/391)	1.00	30.9 (121/391)	1.00	46.0 (180/391)	1.00
– 1	35.0 (35/100)	1.02 NS (0.64-1.62)	31.0 (31/100)	1.00 NS (0.62-1.61)	47.0 (47/100)	1.04 NS (0.67-1.61)
– 2	50.0 (13/26)	1.90 NS (0.86-4.21)	50.0 (13/26)	2.23* (1.00-4.96)	61.5 (16/26)	1.88 NS (0.83-4.27)
– >=3	42.4 (14/33)	1.40 NS (0.68-2.87)	48.5 (16/33)	2.10* (1.02-4.20)	60.6 (20/33)	1.80 NS (0.87-3.73)
– Don't know	22.2 (2/9)	-	77.8 (7/9)	-	88.9 (8/9)	-
Total	**35.6 (199/559)**		**33.6 (188/559)**		**48.5 (271/559)**	
Last *MAMTA DAY* attended						
Yes (RC)	33.2 (94/283)	1.00	27.2 (77/283)	1.00	45.6 (129/283)	1.00
No	39.0 (106/272)	1.28 NS (0.91-1.82)	39.3 (107/272)	1.73** (1.21-2.48)	51.8 (141/272)	1.28 NS (0.92-1.79)
Total	**36.0 (200/555)**		**33.2 (184/555)**		**48.6 (270/555)**	
***Balbhog* consumed in 24 hours preceding the survey**						
– Yes (RC)	38.1 (43/113)	1.00	49.6 (56/113)	1.00	56.6 (64/113)	1.00
– No	37.9 (77/203)	0.99 NS (0.62-1.60)	41.7 (86/206)	0.73 NS (0.46-1.16)	56.6 (116/205)	1.00 NS (0.63-1.59)
Total	**38.0 (120/316)**		**44.5 (142/319)**		**56.6 (180/318)**	

*RC = Reference Category with OR=1.00; * Significant at p<0.05, ** Significant at p<0.01, *** Significant at p<0.001; Total may be different due to missing values*

Discussion – Factors Affecting the Nutritional Status of Children Under Two Years

1. Household, Mother and Child Background Characteristics

Among all the indicators, children belonging to lower SES or having no access to toilet facility or born to illiterate mothers had significant higher odds of being underweight.

a) *Socio Economic Status (Kuppuswamy's SES scale, 2007)*

In the current study, a strong association between SES status, caste and undernutrition was noted. The prevalence of wasting (46.2%, OR 1.70, $p<0.05$) and underweight (61.1%, OR 1.88, $p<0.01$) was significantly higher among the lower SES as compared to children in upper lower SES. Also, the prevalence of underweight and stunting was significantly higher among ST and OBC as compared to, children in the general category.

The NFHS-3 survey also showed that in India the prevalence of stunting (59.9%), wasting (25.0%) and underweight (56.6%) was highest among children below five years, in the lower wealth index. The children belonging to SC, ST, or OBC had relatively high levels of undernutrition according to all three measures. Children from ST had the poorest nutritional status on almost every measure; particularly the high prevalence of wasting (28%) was a big concern (NFHS-3 2007). Also, the NFHS-3 survey showed similar results for the state of Gujarat (NFHS-3 Gujarat 2008). A, study in urban slums of Vadodara also showed that the children belonging to the ST had significantly lower HAZ score (-1.7) compared to the other castes (Sharma and Mandlik 2007).

b) *Household Water, Sanitation condition and Hand-washing Practices*

Mertens *et al.* (1990) found that the presence of a clean water supply and sanitary facilities have beneficial effects on child growth and nutrition. Rao *et al.* (1998) showed that poor environmental conditions giving rise to infections were found to play a major role in influencing the nutritional status of preschool children in slum community.

In the current study, the odds and prevalence of underweight (50.3%, OR 1.64) and stunting (35.7%, OR 1.73) was significantly higher ($p<0.05$) among children without access to household toilet facility. There was a significant association between

wasting (OR 1.72, p<0.01), and unsafe practice of drawing water. Also, the odds and prevalence of being underweight (59.3%, OR 1.15) and wasting (43.1%, OR 1.33) was higher among children not washing hands before eating, but the difference was statistically not significant.

Another study, in urban slums of Vadodara, showed a significant association between the environmental cleanliness score and prevalence of wasting. Better cleanliness score was positively correlated with WAZ (0.143, p<0.01) (Sharma and Mandlik 2007).

c) *Background characteristics of Mother*

In the current study except for mother's education, no other variable (like occupation and age) was significantly associated with prevalence of stunting (p<0.05) and underweight (p<0.01) among children below 2 years. It was noted that, the prevalence of underweight and wasting was higher in older mothers (26-30 years) and the mother's with unskilled occupation had highest (75%) underweight and stunted children.

Similarly the NHFS-3 survey also reported that undernutrition has a strong negative relationship with the mother's education. The percentage of children (below five years) who were severely underweight was almost five times as high for children whose mothers had no education compared to the children whose mothers had 12 or more years of education (NFHS-3 2007).

A study by Sharma and Mandlik in 2007, in urban slums of Vadodara, also showed that there was a significant correlation between education of the mother and WAZ score (0.134, p<0.05) among children below 3 years. Also, a case-control study in Bangladesh (N=250, 0-36 mo.) found that maternal education was significantly associated with severe malnutrition. Chronic malnutrition was highest among children of illiterate mothers (Islam *et al.* 1994).

d) *Background characteristics of Child*

In the current study, among the direct factors sex, age of the child and birth weight were found to be significantly associated with undernutrition in children.

The odds and prevalence of stunting and wasting was significantly higher among males and older children 12-23 months. Also among children in the age group of 6-11 months, the odds of stunting (p<0.001) was significantly higher.

Similarly, in a study among children in urban slums of Vadodara, the age of the child was found to be significantly associated with percent prevalence of stunting. A higher

number of children above 24 months (50%) had normal HAZ as compared to those ≤24 months of age (32.5%). The multiple regressions showed that age of the child explained 5.3% of variation in WHZ scores (Sharma and Mandlik 2007).

In the current study, the odds of being underweight (OR 2.83, $p<0.001$) and wasted (OR 1.97, $p<<0.01$) was significantly higher among low birth weight (LBW<2500 gms).

The NFHS-3 survey also showed that in India as well as in Gujarat the children who are judged by their mother to have been small or very small at the time of birth are more likely to be undernourished than those who were average size or larger were (NFHS-3 2007 and NFHS-3 Gujarat 2008).

Sharma and Mandlik, in urban slums of Vadodara in 2007, showed that the prevalence of mild underweight and mild wasting (IAP classification) was higher in the subjects (41.7% and 22.2%) who had LBW as compared to the subjects (21.4% and 14%) who had normal birth weight.

In the current study, the prevalence of wasting ($p<0.05$) among children suffering from diarrhea was statistically significant. Sharma and Mandlik (2007) also showed that the mean WAZ and WHZ were significantly higher in case of children who had not experienced infectious morbidities, less episodes of morbidities and shorter duration. Also, Ramachandran and Gopalan in 2009, comparing the relative risk (RR) for infections in undernourished children using NHFS-3 data showed that the RR of morbidity due to infections was higher and more consistently seen in children with low BMI and wasting as compared to stunting or underweight. The small group of children who had stunting with wasting had the highest RR of morbidity due to infection.

2. Infant and Young Child feeding Practices

In the current study, with reference to three IYCF practices, EIBF, EBF, and introduction of CF, the difference in prevalence of undernutrition was statistically not significant for all the three undernutrition indicators. The children who did not have EIBF had comparatively higher prevalence and odds of wasting (OR 1.18) and stunting (OR 1.59) as compared to children who had EIBF. EBF did not show any strong association with undernutrition, whereas, age of introduction of CF between 9-18 months showed a marginally higher prevalence and odds of undernutrition, as compared those introduction of CF between 6-8 months.

In the past, various other studies have shown association of undernutrition and IYCF practices. However, only few international studies have shown significant

associations.

A study in urban Allahabad showed that, initiation of breast-feeding after six hours of birth, deprivation from colostrum and improper CF practices were found significant ($p<0.05$) risk factors for underweight. Wasting was not significantly associated ($p<0.10$) with any infant feeding practice studied (Kumar *et al.* 2006).

Sharma and Mandlik, in urban slums of Vadodara (2007), showed that the WAZ and WHZ scores were lower in the subjects who had been EBF for less than 6 months (-1.41 and -0.32) compared to the subjects who were EBF up till 6 months (-0.46 and 2.35). A similar trend was noticed with age of introducing top milk and CF. Similar finding were obtained with HAZ also. However, in the current study, none of the variables tested were significantly associated with undernutrition, except for the age upto which child was EBF.

A linear regression analysis of DHS survey data of Zambia showed that EBF is positively associated with WHZ (effect size (ES) 0.65; $p<0.001$) and WAZ (ES 0.28; $p<0.01$). Timely introduction of CF between 6-8 months was positively associated with HAZ (ES 1.19; $p<0.01$). Higher dietary diversity score was associated with higher HAZ (ES 0.12, $p<0.01$ in Zambia) and WAZ (ES 0.04, $p<0.10$). The findings demonstrate the need to reinforce age - appropriate IYCF practices to address child undernutrition (Disha *et al.* 2012).

3. Utilization of ICDS services for children under two years

The comparisons of ICDS and non-ICDS blocks show statistically significant differences in moderate and severe malnutrition (Avsm *et al.* 1995). However, there is no clear evidence that growth monitoring is beneficial per se. An evaluation of 3704 rural children showed that growth monitoring did not have an impact on weight-for-age or morbidity (Gopaldas *et al.* 1990). Kapil *et al.* (1996) reported no significant difference ($p<0.05$) between growth faltering amongst children weighed regularly at ICDS AWC as compared to, those children weighed irregularly. A study in urban Allahabad showed that, ICDS benefits received by children failed to improve the nutritional status of children (Kumar *et al.* 2006). Thus impact of ICDS services on undernutrition, especially among children below three years has always been questioned.

However, in the current study, the participation of children in monthly GMP showed a positive association with prevalence of undernutrition. Also, the association of stunting with GMP ($p<0.05$) and participation in village health and nutrition day (*MAMTA DAY*) was statistically significant ($p<0.01$).The odds of being

undernourished were also greater for children not weighed in last 2 months (60 days preceding the survey) or who did not attend *MAMTA DAY* regularly.

Lastly, in the current study, no association of undernutrition with consumption of *Balbhog* (fortified ready-to-eat food) was noted among children 6-23 mo. However, Sharma and Bhargava (2008) in a study to assess impact of *Balbhog* supplementation on children (6-23 mo.) showed that, the reduction in prevalence of undernutrition was not significant, but an improvement was noticed. Also, Sharma *et al.* 2011 concluded that *Balbhog* supplement (around 2 mo.) had a positive impact on the anthropometric measurements and hemoglobin levels in children 6-72 months.

II. Process Evaluation

Process Evaluation of the Intervention through Concurrent Assessment

After the capacity building was completed, process evaluation of field practices related to GMP and IYCF was planned through concurrent assessment for a period of 6 months (November 2009 to April 2010). During the concurrent assessment data was obtained using field observations and assessing the monthly progress reports of the AWWs. Overall, 43 AWC visits were made in IG (24 routine days and 19 *MAMTA DAY*s) having 19 AWCs in all, and 35 AWC visits were made in CG (19 routine day and 16 *MAMTA DAY*s) having 17 AWCs in all. AWC wise details of this visit presented in Annexure 8. The following are key observations recorded by the research, as well as, information collected from AWWs.

a) *Preparation of Village Micro plan*

During the capacity building held at monthly Seja meeting, all the AWWs were trained on preparing a *MAMTA DAY* village micro plan. The *MAMTA DAY* village micro plan would support the AWWs for clarity of roles and responsibilities among the *MAMTA DAY* team (AWWs, ASHA, Health, ANM, MPHW etc), as well as, for conducting *MAMTA DAY* in an organised manner.

Post capacity building, there was an increase in availability of village micro plans in IG (Observed on *MAMTA DAY* 66.7% 12/18, Reported by AWWs 77.8%, 14/18), whereas, in the CG except for one AWC (as reported by AWW), the village micro plan was not available in any of the AWC.

b) *Growth monitoring and Promotion*

As presented in Table II-1, although almost all AWWs reported weighing children (U-2 yrs) on *MAMTA DAY*, the actual observation on *MAMTA DAY* revealed, weighing children other than those who had been brought for vaccination, in 94.4% AWCs in IG and about 56.3% AWC in CG.

Table II-1: Status of GMP on *MAMTA DAY*

Indicators	IG				CG			
	Reported by AWW		Observed on *MAMTA DAY*		Reported by AWW		Observed on *MAMTA DAY*	
	N=18	%	N=18	%	N=19	%	N=16	%
Weighing	18	100	17	94.4	19	100	14	87.5
– Below 2 yr	1	5.6	2	11.1	-	-	-	-
– Below 3 yr	3	16.7	2	11.1	2	10.5	-	-
– Below 5 yr	14	77.8	13	72.2	17	89.5	9	56.3
Only vaccination	-	-	-	-	-	-	5	31.3

Further, the percentage of children reported being weighed on *MAMTA DAY* by AWWs in both groups was almost similar, around 64%, however, observations on *MAMTA DAY*, showed, that more children were weighed in IG (36.8%) as compared to CG (26.0%). Also plotting on *MAMTA* card and counseling was noted more in IG as compared to CG (Table II-2).

Table II-2: Coverage of Children below 2 Years for GMP on *MAMTA DAY*

Indicators	Reported by AWW		Observed on *MAMTA DAY*	
	N	%	N	%
	Intervention Group			
Registered	582	-	592	-
Present	375	64.4	220	37.2
Weighed	375	64.4	218	36.8
Plotting on *MAMTA* card	-	-	140	23.6
Counselling on IYCF	-	-	66	11.1
	Control Group			
Registered	633	-	508	-
Present	432	68.2	148	29.1
Weighed	423	66.8	132	26.0
Plotting on *MAMTA* card	-	-	85	16.7
Counselling on IYCF	-	-	29	5.7

** Of caregivers attending MAMTA DAY with children U-2 yrs*

c) *Status of IYCF Counselling* on *MAMTA DAY*

Post capacity building, although almost all AWWs reported counseling on IYCF on *MAMTA DAY*, however, when corroborated by observations, 88.9% AWWs in IG were observed counseling on IYCF as compared to, only 37.5% AWWs in CG. Further, 55.6% AWWs in IG were observed using *MAMTA* card, while counselling on IYCF as compared to 25% in the CG.

Further, the exit interview of mothers of children (U-2 yrs) on *MAMTA DAY* showed that, the counselling on IYCF was higher in IG (55.6%, n=225) as compared to CG (21.3%, n=150). More importantly around 26.6% children in IG were counseled referring to the IYCF guidelines in *MAMTA* card/flip chart/key messages/IEC material, whereas only 20.0% children in CG were counseled referring to the *MAMTA* card.

d) *Counselling of Pregnant Women on EIBF*

The pregnant women (preferably in last trimester) and their family need to be educated and prepared for ensuring EIBF. As a result all the IG-AWWs were especially trained in this regard. Post intervention 88.9% (16/17, 1 AWC had no pregnant women) IG-AWWs and 83.3% (15/18) CG-AWWs reported counseling pregnant women on EIBF during *MAMTA DAY*.

However field observations on *MAMTA DAY* showed 26.7% (4/15, on 3 *MAMTA DAY* visits no pregnant women were present) IG-AWWs were counseling pregnant women about EIBF, as compared to none of the CG-AWWs. This positive outcome may be a result of capacity building of IG-AWWs, as the importance of reinforced counselling on IYCF practices was given a lot of focus.

To assess the quality of counseling, the AWWs were assessed on 10 key messages provided during capacity building (Annexure 6), to be discussed during the counseling on EIBF with pregnant women. It was noted that 50% IG AWWs read all the points and discussed further, whereas the remaining IG-AWWs counseled orally covering few points only. In case of CG where no such guideline was issued, although 57.9% AWWs did counsel on EIBF, but the information shared was not adequate.

Assessing the actual coverage of pregnant women, the AWWs reported (Table II-3) that, almost all, women in third trimester in both the groups were counseled on EIBF; however, the counselling of family members on EIBF was reported better in IG as compared to CG, which may be attributed to the capacity building.

Table II-3: Status of Pregnant Women Counselling as Reported by AWWs

Indicators	IG		CG	
	N	%	N	%
Total Pregnant Women in Last Trimester	69		40	
– Present in Village	63	91.3	31	77.5
– Present on *MAMTA DAY*	45	65.2	30	75.0
– Met during home visit	45	65.2	33	82.5
Counselling on EIBF *				
– On *MAMTA DAY*	44	63.8	28	70.0
– AWC on another day	4	5.8	5	12.5
– During home visit	40	58.0	25	62.5
Counselling on EIBF to family members*				
– On *MAMTA DAY*	5	7.2	3	7.5
– AWC on another day	2	2.9	1	2.5
– During home visit	36	52.2	12	30.0

** Multiple responses possible*

It was observed that most pregnant women visited the *MAMTA DAY* without any family member. Among the pregnant women in last trimester who visited *MAMTA DAY*, 37.6% were observed being counseled on EIBF in IG as compared to, 26.1% in CG (Table II-4). However, the status of counselling may not be concluded as poor, since some pregnant women may have been counseled at some other point in time, either before or after the observation. Importantly, as a result of capacity building, the percent women counseled on EIBF were more in IG.

Table II-4: Status of Pregnant Women Counselling Observed on *MAMTA DAY*

Pregnant Women Counseling	IG		CG	
	N=32	%	N=23	%
Pregnant Women who visited AWC on *MAMTA DAY*				
– 7 months	13	40.6	4	17.4
– 8 months	8	25.0	10	43.5
– 9 months	11	34.4	9	39.1
Weighed today on *MAMTA DAY*	29	90.6	23	100.0
Immunized or check up done	12	37.5	6	26.1
Counseling on EIBF				
• Yes, by self (AWW)	6	18.8	6	26.1
• Using key messages provided during capacity building	6	18.8	-	-
• No	20	62.5	17	73.9
Counseling on EIBF to family member				
– Yes, by self	2	6.3	2	8.7
– No	1	3.1	2	8.7
– No body to accompany	29	90.6	19	82.6

e) *Balbhog Distribution on MAMTA DAY*

For enhancing the CF practices, it is very important that AWWs not only distribute the fortified *Balbhog* to children, but ensure that the caregivers understand the importance of giving *Balbhog,* as well as, use it optimally for their child. Hence, the capacity building of IG AWWs emphasized distribution of *Balbhog* after the GMP activity along with counselling on IYCF practices.

However, no major conclusions could be reached regarding distribution and utilization of *Balbhog* on *MAMTA DAY*, since at the time of evaluation; the availability of *Balbhog* at the AWCs was inconsistent.

The major changes observed after capacity building were, as presented in Table II-5, all IG-AWWs reported distributing *Balbhog* on *MAMTA DAY* as compared to 36.8% AWWs in CG. Also, 93.8% IG-AWWs reported having distributed *Balbhog* on previous *MAMTA DAY* as compared to only 25% in CG.

Post capacity building, the AWWs reported that, mothers of almost all children who completed 6 months were given counselling on initiation of complementary food, in both the groups (Table II-5). However only 45.5% children completing 6 months were being given *Balbhog* in CG as compared to, 83.3% in the IG, which may be attributed to the capacity building of the IG-AWWs; this was excluding all those children in the AWCs where *Balbhog* supply was not available.

Table II-5: Status of *Balbhog* distribution as Reported by AWWs during Routine Visits

***Balbhog* Distribution**	**IG**		**CG**	
	N=18	**%**	**N=19**	**%**
On *MAMTA DAY*	18	100.0	7	36.8
O*n previous *MAMTA DAY	**15/17**	93.8	**2/8**	25.0
– After GMP	14	82.4	1	12.5
– Other	2	11.8	1	12.5
Children completing 6 mo.	**N=30**		**N=28**	
Counseling on Initiation of Complementary Food *				
– On *MAMTA DAY*	23	76.7	16	57.1
– AWC on another day	4	13.3	3	10.7
– During home visit	15	50.0	22	78.6
Distribution of *Balbhog*	25	83.3	5	45.5
– On *MAMTA DAY*	19	63.3	2	7.1
– AWC on another day	2	6.7	2	14.3
– During home visit	6	20.0	3	3.6
– No stock	-	-	17	-

** Multiple responses possible*

Due to non-availability of supply in 11/18 IG and 2/16 CG during the *MAMTA DAY*, the observations on *Balbhog* distribution were restricted to centers where *Balbhog*

was available. A presented in Table II- 6, it was noted that only 21.4% children 6-23 months in IG were given *Balbhog* on *MAMTA DAY* as compared to 5.4% in CG.

Table II- 6: Status of *Balbhog* Distribution and Counselling of Children 6-23 months observed on *MAMTA DAY*

***Balbhog* Distribution**	**IG**		**CG**	
	N=225	**%**	**N=150**	**%**
Not eligible for *Balbhog*	52	23.1	51	34.0
Balbhog stock not available at AWC	145	64.4	7	4.7
Balbhog* distribution on *MAMTA DAY	**N=28**		**N=92**	
1. No	18	64.3	82	89.1
2. After Weighing	6	21.4	5	5.4
3. Distribution of *Balbhog* with guidance				
– Explain *Balbhog* benefits	-	-	5	5.4
– Explain how to make *Balbhog*	2	7.1	4	4.3
– Explain recipes from *Balbhog*	2	7.1	1	1.1

f) *Use of Flip Charts*

During capacity building, the AWWs were provided IYCF flip charts, as a counselling tool for pregnant women and care givers of children below 2 years (Annexure 4). The IG-AWWs were also trained on using the flip chart, during the capacity building role play sessions.

Post capacity building, all AWWs of IG reported having IEC material related to IYCF and especially the IYCF flip chart that was provided during the capacity building, whereas in CG, only 32% AWWs reported having IEC material (Table II-7). Further, post capacity building, the use of IEC material on *MAMTA DAY* and, during home visits was greater among IG-AWWs as compared to the CG-AWWs. Also, the IG-AWWs used the material for all groups of beneficiaries, and especially pregnant women and lactating mothers.

Table II-7: Availability of IEC Material on IYCF as Reported by AWWs

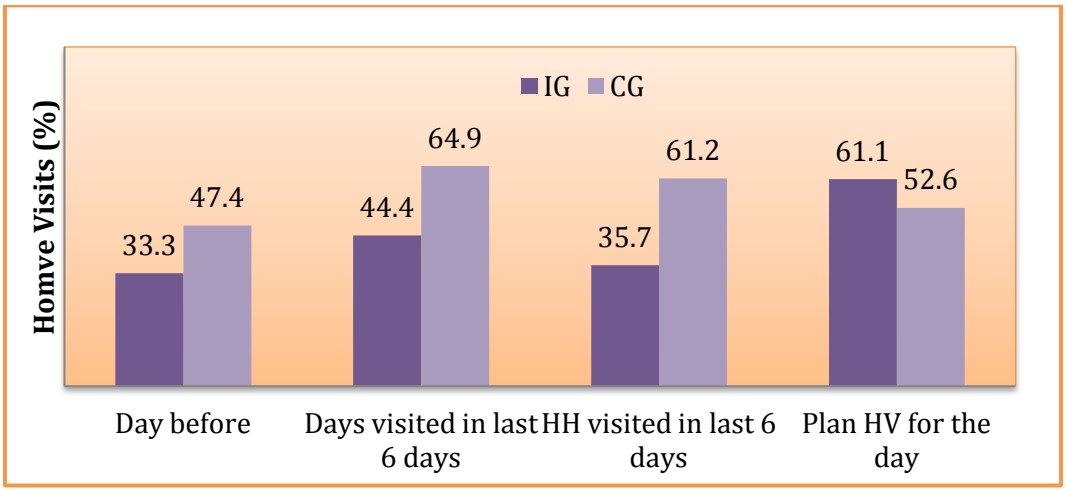
Indicators	**IG**		**CG**	
	N=18	**%**	**N=19**	**%**
IEC material available at AWC	18	100.0	6	31.6
Type of IEC material available				
✓ Flip chart	18	100.0	-	-
✓ Other	10	55.6	6	31.6
Use of IEC material				
✓ *MAMTA DAY*	12	66.7	-	-
✓ Home visit	12	66.7	3	15.8
✓ At AWC other then *MAMTA DAY*	6	33.3	2	10.5
Beneficiary counseled using the IEC material				
✓ Pregnant women	15	83.3	5	26.3
✓ Lactating mothers (children 0-6 mo.)	15	83.3	3	15.8

Indicators	IG		CG	
	N=18	%	N=19	%
✓ Children 6 mo. to one year	4	22.2	-	-
✓ Children above 1 year	1	5.6	-	-

g) *Home visits by AWWs*

The AWWs, during the capacity building, were provided guideline for selection of households as presented in Annexure 7, as well as list of important tools and activity to be conducted during home visits. Although as presented in Figure II-1, post capacity building, the percentage of home visits were reported better by CG-AWWs as compared to IG-AWW, as discussed later the IG-AWWs conducted home visits in a more planned and effective manner. Also, when actually observed, on an average, the AWWs in both the groups visited around 2 households each per day.

Figure II-1: Status of Home Visits Post Capacity Building



***Note**: HV – Home visit, HH - Household*

The reasons for not making home visits were as follows;

Intervention Group	Control Group
– No reason (1)	– Recipe competition in village (2)
– AWW sick (2)	– Polio round (1)
– On leave (2)	– On leave (2)
– Seja/sector meeting (2)	– Due to holiday
– ICDS work (2) like compiling survey, in charge of another AWC	– Seja/sector meeting (3)
– No home visit for last six days (2)	– Preparation for recipe competition and ongoing *Swarnim Gujarat Rath Yatra*
– Non ICDS work like *sakhi mandal* and CM meeting invitation in village	– Death in relation
– Personal work (2) hence out of station; had to take husband to hospital	
– AWW Sick (2)	– Non ICDS Work (2); *Sakhi* Mandal; *Gramsabha*
– Other ICDS Work (2); School health checkup for AWC and TB patient identification; cleaning of chana	– Helper went early
	– Other ICDS work (3); GMP of hamlet;

Intervention Group	Control Group
– Death in village; – Had to go for union meeting at Vadodara	filling growth chart register and submit to office; take pregnant women to taluka for injection every Monday – Home visits in evening when families available

Both groups mainly covered children under 6 months (IG-36%, CG-50%), pregnant women (IG-36%, CG-25%) and children 6-23 months (IG-28%, CG-15%). The CG AWWs also visited children above 2 years (10%), which was not observed in the IG, as they had been asked to prioritize and focus home visits to cover pregnant women, undernourished/*Balbhog*/*MAMTA DAY* non compliant children below 2 years and severely undernourished children below 5 years.

As presented in Figure II-2 and Figure II-3, post capacity building, home visits were conducted in a more planned manner in IG as compared to CG. The IG-AWWs visited households with essential items for recording (such as IMNCI registers, visit book), counselling (IYCF flip charts and *MAMTA* card) and distribution (such as *Balbhog*). Also, as a result of capacity building, the IG-AWWs used *MAMTA* card as a counselling and follow-up tool during home visits, and utilized the opportunity of home visits to advocate and ensure complete and correct use of *Balbhog* with personalized counselling on the same during home visits.

Figure II-2: Items Carried by AWWs during Home Visits

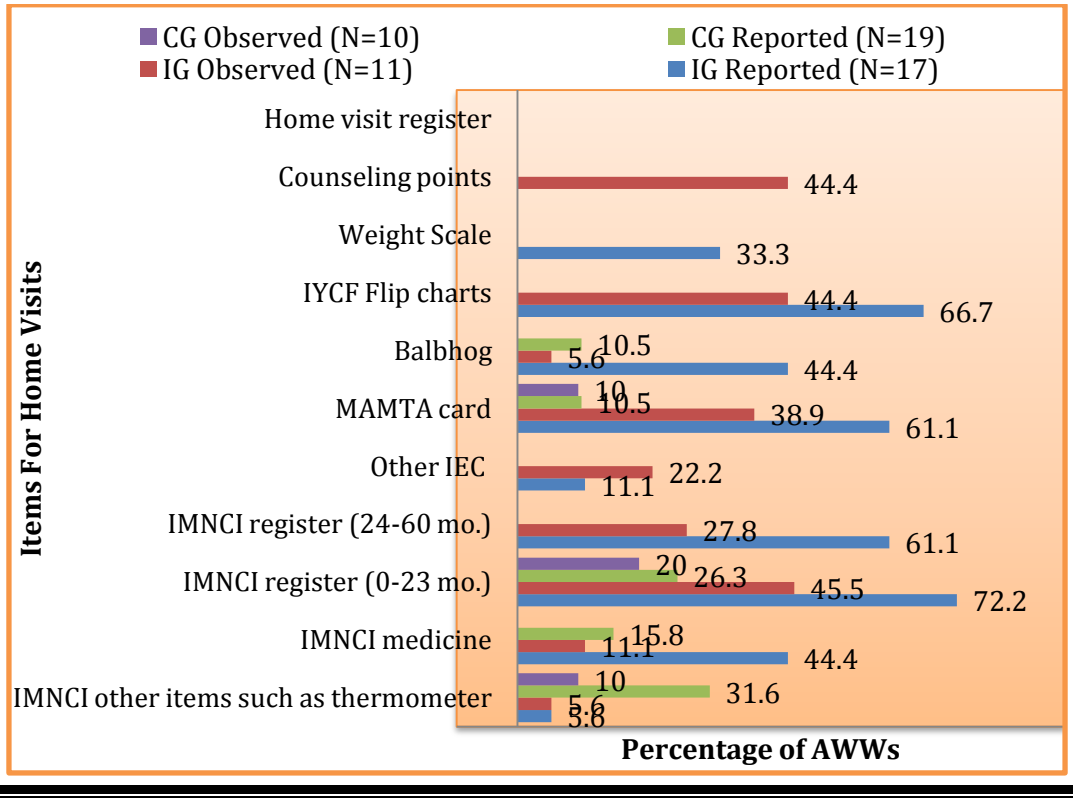
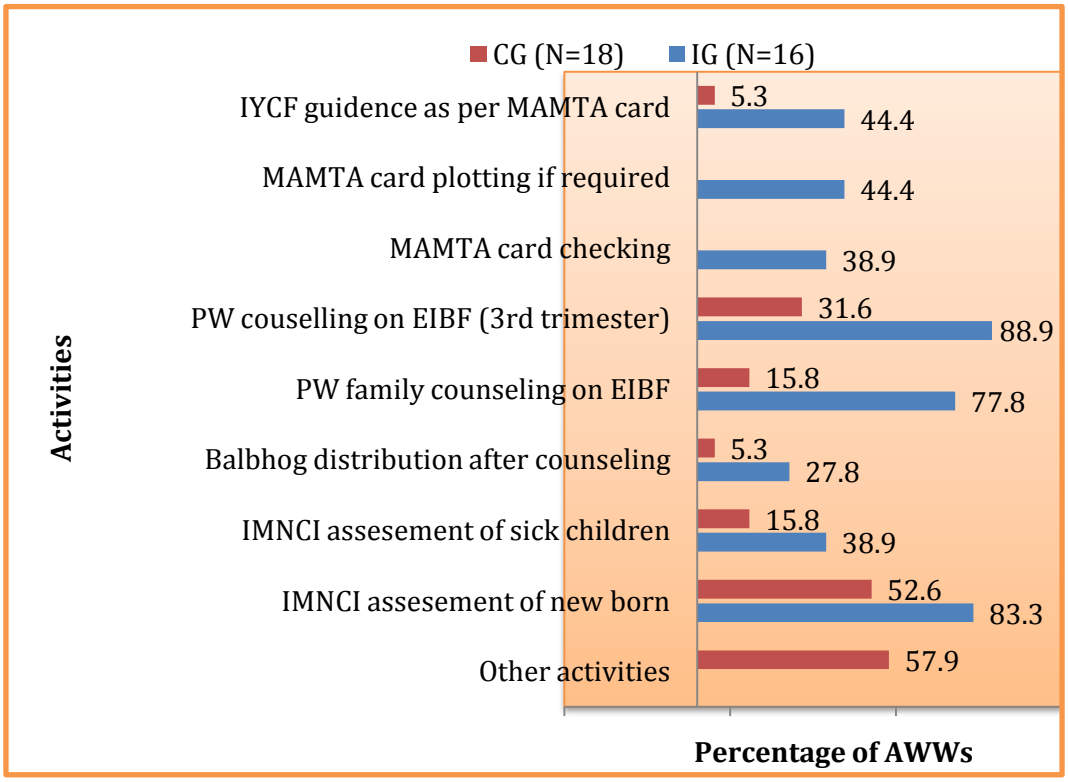


Figure II-3: Activities Conducted by AWWs during Home Visits



***Note**: PW- pregnant women*

Home visits of New born child by AWWs

During the field observations, total 16 and 19 children were born in IG and CG respectively. As can be seen from Table II-8 overall the number of home visits was more in CG as compared to IG, with 47% children visited at least 3 times, as compared to only 25% in IG. Also the numbers of IMNCI forms filled were more in CG as compared to the IG. However, the positive impact of visits on aspects such as early initiation of breastfeeding was observed among all newborns in IG as compared to CG, showing a more focused and organised home visits by IG-AWWs, with good quality inputs.

Further, in CG only one message was predominantly given by AWWs i.e. on EBF till 6 months, whereas, the IG AWWs, along with message on EBF till 6 months, also tried to address possible issues which could lead to failure in EBF till 6 months ensuring that more mother's who wished to EBF succeed in doing so.

Table II-8 : New Born Home Visits details Post Intervention

Indicators	IG			CG		
	N=16	%	Max, Min	N=19	%	Max, Min
Age in days at time of home visit	-	-	30, 8	-	-	30,12
Place of birth						
– Institution	12	75.0	-	17	89.5	-
– Home	4	25.0	-	2	10.5	-
Low Birth Weight	6	37.5	-	10	52.6	-
Home Visits (days)						
– At least once	14	87.5	17, 1	18	94.7	10, 1
– At least two	9	56.3	7, 2	16	84.2	15, 3
– At least three	4	25.0	21, 3	9	47.4	18, 4
– At least four	1	6.3	7, 7	2	10.5	21, 8
– At least five	-	-	-	1	5.3	9, 9
– At least six	-	-	-	1	5.3	10,10
IMNCI form filled	8	50.0	2, 1	18	94.7	3, 0
BF initiation	-	-	0, 0	-	-	96,0

Thus, it can be concluded that, post capacity building, the quality of implementation of services by AWWs improved among IG-AWWs as compared to CG-AWWs which could be instrumental in achieving required behaviour changes in IYCF and GMP.

III. Impact Assessment

A. Impact of Capacity Building of *Anganwadi* workers on the Knowledge, Perceptions and Practices of the *Anganwadi* Workers and the Supervisors

This section of results and discussion addresses the following specific objective of the study;

- ✓ **To assess the impact of capacity building on knowledge and perceptions of *Anganwadi* workers' with regard to growth monitoring and promotion, and infant and young child feeding practices.**

The impact was assessed on four major areas i.e., Infant and Young Child Feeding Practices (IYCF), Growth Monitoring and Promotion (GMP), Diet during pregnancy and lactation and Inter Personal Counselling (IPC) skills. Only the key responses have been discussed in the following sections.

Before post data collection one AWW of IG resigned, hence the post data tabulation

was done for IG AWWs considering 18 AWWs in pre and post group.

During the intervention period, besides the 13 capacity building sessions (Annexure 5) for IG-AWWs; the two IG-AWWs and six CG-AWWs took regular ICDS refresher training during intervention period. Further, with the introduction of new WHO growth chart, all the AWWs went through growth chart training. The IG-Supervisors participated in the preparation of IYCF training module and capacity building of IG-AWWs, during intervention. Besides this, both the Supervisors were oriented on new WHO growth chart and *Annaprashan* day (one day of month where AWWs initiate CF among children completing 6 months, as well as, promote CF practices in children above 6 mo.) through ICDS. These programs were eventually introduced in their respective field area by Supervisors.

1. Key IYCF Practices

All four key IYCF practices were repeatedly discussed with IG-AWWs during capacity building and *Seja* meetings in presence of IG-Supervisor. As a result, post capacity building, significant ($p<0.01$) improvement in knowledge score of all three IYCF practices was noted among IG-AWWs (Table III-1). As against this the improvement among CG-AWWs was lower and statistically non-significant. The difference between the knowledge scores between the two groups before capacity building was not significant, however, post scores were significantly higher in the IG group as compared to CG ($p<0.05$). A significant finding was the three fold increase in the percent of IG AWWs who were able to mention all three key IYCF practices correctly and the four fold increase in those who could mention all four key IYCF practices (Table III-1).

Post capacity building, the IG-Supervisor, was also able to capture all four IYCF practices except for the age of initiating CF, whereas; the CG-Supervisor could only list two key IYCF practices. Also, the IG–Supervisor was able to list practices more systematically as compared to CG- Supervisor.

Table III-1: Change in Knowledge of AWWs Regarding Key IYCF Practices

Key IYCF Practices	Pre % (score)		Post % (score)	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
1) EIBF, within 1 hour	58 (10.5)	41 (7)	94 (17)	65(11)
2) EBF for 6 mo.	67 (12)	88 (15)	94 (17)	88 (15)
3a) Appropriate and adequate CF from 6 mo.	83 (15)	88 (15)	100 (18)	94 (16)
All 3 correct	**28 (5)**	**24 (4)**	**89 (16)**	**53 (9)**
3b) Continued BF upto 2 yrs and beyond	44 (8)	18 (3)	50 (9)	32 (5.5)
All 4 correct	**11 (2)**	**6 (1)**	**44 (8)**	**18 (3)**
Mean score	2.5±0.98	2.4±0.84	3.4±0.68	2.8±0.73
Independent T-test	0.57 NS		2.50*	
Paired T-test	IG: -3.05** CG: -1.69 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

2. Breastfeeding

The messages on benefits of EBF, EIBF and continuation of breastfeeding were formulated based on baseline learning's, as well as, feedback of IG-AWWs during capacity building. These messages were formulated considering the problems faced by mothers, which lead to the discontinuation of these practices, as well as, benefits to children on following the optimal feeding practices. These messages were expected to convince the community to persistently follow the optimal IYCF practices. The IG ICDS Supervisor also did one to two rounds of hands-on capacity building using these messages.

a) *Benefits of Breastfeeding*

As presented in Table III-2, post intervention, the mean knowledge score of AWWs improved significantly ($p<0.01$) among IG from 2.83±1.654 to 4.22±2.340, whereas among CG the mean score improved significantly ($p<0.05$) from 2.24±1.200 to 3.18 ±2.038. Such an improvement in knowledge would give the AWWs conviction in communicating about optimal IYCF practices to the community.

Post capacity building, the average benefits listed per IG-AWW improved from 4 benefits to 7 benefits as compared to an improvement from 3 benefits to 5 benefits listed by CG-AWWs.

The key benefits listed by AWWs were; 'breastfeeding delays next pregnancy' (IG 61%, CG 76%), 'breastfeeding protects against infection and enhances immunity' (IG 50%, CG 29%) and 'breastfeeding reduces post delivery bleeding and anemia' (IG 50%, CG 12%). Further as compared to baseline, 2.5 times more IG AWWs, stated

that 'breastfeeding the babies is more economical involving less cost', and 3 times more CG-AWWs, stated that 'breastfeeding prevents breast engorgement'.

Table III-2: Change in Knowledge of AWWs Regarding Benefits of Breastfeeding

Breastfeeding	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Number of Benefits Listed by AWWs				
0	-	-	5.6 (1)	5.9 (1)
1 to 5	94.4 (17)	100 (17)	61.1 (11)	82.4 (14)
6 to 8	5.6 (1)	-	33.3 (6)	11.8 (2)
Min, Max	0,6	1,5	0,8	0,8
Mean score	2.83 ±1.654	2.24 ±1.200	4.22 ±2.340	3.18 ±2.038
Independent T-test	1.218 NS		1.406 NS	
Paired T-test	IG:-3.18** CG:-2.89*			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Among the ICDS Supervisors, the knowledge regarding benefits of breastfeeding improved marginally in IG-Supervisor as compared to no such impact in CG-Supervisor.

b) *Early Initiation of Breastfeeding*

There was a remarkable improvement among IG-AWWs, regarding their knowledge about EIBF, showing a positive impact of capacity building. Post capacity building, the mean knowledge score of IG-AWWs, regarding EIBF, improved significantly ($p<0.001$) from 2.28 to 4.00, while it remained around 2.5 in the CG. While, the predata scores were similar in the two groups, the difference in post intervention knowledge score, between the two groups, was statistically significant, $p<0.001$(Table III-3), with IG having higher scores.

Overall, 14/15 benefits of EIBF were listed by IG-AWWs whereas, CG-AWWs listed 7/15 benefits only. The key benefits listed by IG and CG AWWs included; '*EIBF provides colostrum'* (IG 89%, CG 88%), '*EIBF improves the chances of maternal and child survival*' (IG 50%, CF 0%), and '*EIBF benefits babies health*' (IG 22%, CG 41%). As presented in Table III-3, the number of benefits listed by AWWs was better for IG as compared to CG respectively. The knowledge score of AWWs regarding the benefit that '*EIBF stimulates breast milk production*' improved among IG-AWWs by 1.5 times and CG-AWWs by 3 times.

Table III-3: Change in Knowledge of AWWs Regarding Early Initiation of Breastfeeding

Early Initiation of Breastfeeding	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % N=17)
When	89 (16)	82 (14)	94 (17)	82 (14)
Number of Benefits listed by AWWs				
0	11.1 (2)	5.9 (1)	-	-
1to3	88.9 (16)	94.1 (16)	61.1 (11)	100 (17)
4 to 5	-	-	38.9 (7)	-
Min, max	0,3	0,3	1,5	1,3
Mean score	2.28 ±0.826	2.53±0.717	4.00±1.372	2.65±0.702
Independent T-test	-0.959 NS		3.639***	
Paired T-test	IG:-4.56***CG: -0.49NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

The knowledge of IG-Supervisor also improved and she was able to share some very important benefits which were part of key messages formulated for IG-AWWs. This included EIBF helps in establishing breastfeeding, EIBF provides warmth by early skin contact and suckling reflex is most active at the time of birth. There was no remarkable improvement, in knowledge of CG-Supervisor, with regard to EIBF.

Colostrum Feeding

Post capacity building, the knowledge of IG-AWWs regarding colostrum feeding improved significantly (p<0.001) (Table III-4). The IG-AWWs listed 7/8 benefits of colostrum feeding, whereas, no such impact was noted among CG-AWWs.

The major benefits listed by AWWs were that; '*colostrum feeding protects from infection'* (IG 67%, CG 88%), '*colostrum enhances immunity'* (IG 61%, CG 35%) and '*colostrum is the first vaccine'* (IG 50%, CG 12%). The highest improvement among IG-AWWs was in their knowledge regarding, 'colostrum feeding enhances immunity' (2.2 times IG, ↓0.3 times CG), whereas among CG-AWWs highest improvement was in AWWs knowledge regarding; '*colostrum feeding protects from diseases'* (↓0.1times IG, 1.2 times CG).

There was no improvement in the knowledge about colostrum feeding among both the Supervisors.

Table III-4: Change in Knowledge of AWWs Regarding Colostrum feeding

Colostrum Feeding	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Number of Benefits listed by AWWs				
0	5.6 (1)	5.9 (1)	-	5.9 (1)
1 to 3	94.4 (17)	94.1 (16)	94.4 (17)	94.1 (16)
4 to 6	-	-	5.6 (1)	-
Min, Max	0,2	0,3	0, 6	0,3
Mean Score	2.39 ±0.608	2.53 ±0.874	3.22 ±1.166	3.18 ±2.651
Independent T-test	-0.555 NS		0.067 NS	
Paired T-test	IG:-4.56*** CG:-0.49 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Initiation of Breastfeeding after Caesarean Section

The mean knowledge score of IG-AWWs regarding initiation of breastfeeding after caesarean section improved significantly (p<0.05) by 39.6% as compared to CG-AWWs (16.3%) respectively. Although awareness regarding how to initiate breastfeeding after caesarean section improved among IG-AWWs, only one AWW in each group clearly stated that, breastfeeding after caesarean section can be successfully initiated after 4 hours of operation, when the mother is out of anesthesia. Further, there was no marked improvement in the knowledge of both the Supervisors on initiating breastfeeding after cesarean.

Prelacteal feeding

The knowledge of AWWs (percent average score), with reference to prelacteal feeding, in both groups did not show any major significant improvement. Also, the Supervisors did not state the special messages, which were formulated to discourage care givers from using prelacteals, such as “Many prelacteals induces sleep in children, due to some sedative which may be harmful for newborn brains”.

c) *Exclusive Breastfeeding till 6 months – Definition and Benefits*

Although post capacity building, the AWWs and their Supervisors in both groups missed out listing that prescribed medicine could be given while EBF, significant improvement in mean knowledge score regarding definition of EBF was noted among IG-AWWs as compared to baseline (p<0.001), as well as compared to CG-AWWs post intervention (p<0.05) (Table III-5).

The major improvement in knowledge related to benefits of EBF among IG-AWWs was regarding ‘*EBF children has less morbidity’* (IG 1.4 times, CG 1.9 times), ‘*less diarrhea and/or vomiting*’ (IG 2.9 times, CG no change) and ‘*less respiratory*

infections' (IG 5.5 times, CG no change). Among CG, the major improvement was related to the knowledge regarding '*EBF child doesn't require water'* (IG NA[10], CG 2.4 times) and '*EBF provides everything in right amount'* (IG 0.8 times and CG 4.8 times).

Table III-5: Change in Knowledge of AWWs Regarding Exclusive Breastfeeding

Exclusive Breastfeeding	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Duration				
Till 6 mo.	100 (18)	94 (16)	100 (18)	88 (15)
Definition				
– Only breast milk	100 (18)	94 (16)	100 (18)	100 (17)
– No food	44 (8)	41 (7)	50 (9)	29 (5)
– No fluid	33 (6)	53 (9)	89 (16)	72 (13)
– Not even water	89 (17)	76 (13)	100 (18)	94 (16)
– Except prescribed medicine	-	-	-	-
– No prelacteal feed	39 (7)	47 (8)	94 (17)	71 (12)
Number of Benefits listed by AWWs				
0	-	17.6 (3)	11.1 (2)	11.8 (2)
1 to 3	94.4 (17)	82.4 (14)	66.7 (12)	82.4 (14)
4 to 5	5.6 (1)	-	22.2 (4)	5.9 (1)
Min, Max	1,4	0,3	0,5	0,4
Mean Score	5.89± 1.323	5.41± 1.278	8.22± 1.592	6.29± 1.572
Independent T-test	1.084 NS		3.603*	
Paired T-test	IG: -6.621*** and CG: -2.985**			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Further, while defining EBF, both Supervisors also added that if mother is not having adequate breast milk, then top milk should be given; such advice while explaining EBF should be seriously discouraged. *"If not able to get breast milk than can give animal milk with sugar using cup and spoon- CG-Supervisor" "If mother not having breast milk, she can give animal milk preferably goat milk- IG-Supervisor".* Among the IG Supervisor, there was a marked improvement regarding the reason for EBF; the IG-Supervisor mentioned that EBF would ensure proper weight gain, which was critical message to be shared with community for ensuring EBF; however, this was not specified by CG-Supervisor.

[10] 0/18 at baseline and 1/18 post intervention

d) *Frequency and Duration of Breastfeeding*

The frequency and duration of breastfeeding were two of the seven key messages formulated in the capacity building with regard to EBF. The mean knowledge score of IG-AWWs improved by 34.6% (1.44 to 1.94) as compared to CG 19.23% (1.53 to 1.82).

Also, the IG-Supervisor's clarity on frequency of breastfeeding continued to be better, with the critical word '*minimum'* 2 to 3 hours included by her, whereas none of the two supervisors included "*minimum*" 20-30 minutes each time, while mentioning the duration of breastfeeding.

Not Enough Breast Milk

The issue of mothers complains on *"Not Enough Breast Milk"* was raised by IG-AWWs during monthly capacity building *Seja* meetings. This query was addressed in the presence of Supervisors. All IG-AWWs were explained repeatedly that the frequency of urination and weight gain of the baby, are the two key indicators for verification of mothers query on *"Not Enough Breast Milk"*.

As a result, post capacity building there was an improvement in the knowledge of IG-AWWs, with 50% more IG-AWWs being aware of at least one indicator to assess insufficient breastfeeding i.e. frequency of urination and or weight gain. Overall, the mean average score of IG–AWWs improved significantly ($p<0.001$) by 7 times from 0.39 ± 0.608 to 2.72 ± 2.191, whereas, no such improvement was noted among CG-AWWs where the mean score marginally declined from 0.88 ± 0.928 to 0.59 ± 0.939 . Post intervention, the difference in mean knowledge score of two groups ($p<0.05$) were also statistically significant.

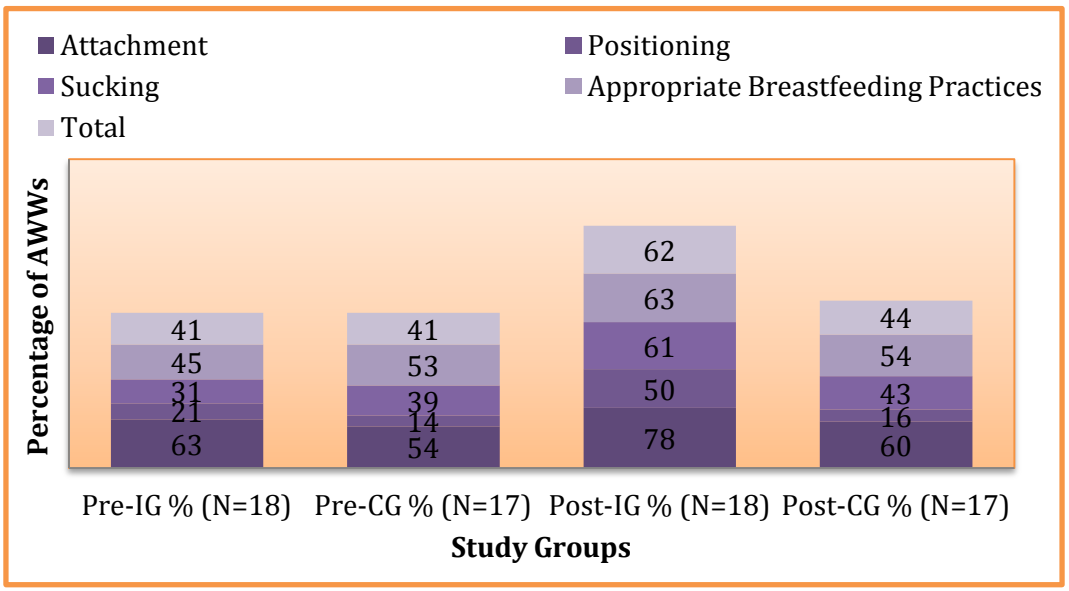
Post capacity building, the Supervisors did not mention checking babies frequency of urination or weight gain, for addressing the most common mothers complaint about 'Not Enough Breast Milk'. The Supervisors on the contrary used false indicators like cry, sleep, and finger licking to confirm mothers complain. The CG-Supervisor also inappropriately recommend giving top milk with cup and spoon, however later on she did partly recommend checking the weight gain of respective baby.

This showed that the IG-Supervisor in-spite of receiving the training on addressing the query on '*Not Enough Breast Milk'*, never understood the seriousness of mother's problem, as well as the severe implications of this problem on optimal feeding practices.

e) *Methods of Breastfeeding*

The knowledge of AWWs, pre and post capacity building, was assessed regarding the methods of breastfeeding including signs of attachment, positioning, suckling, and AWWs knowledge on other appropriate breastfeeding practices such as, breastfeeding at night, using both breasts, using alternate breast during each feed and breastfeeding in side lying position. As presented in Figure III-1, overall, the mean knowledge score of IG-AWWs significantly ($p<0.001$) improved by 57.7% as compared to only 11.6% improvement in CG-AWWs. The post intervention difference in mean knowledge score of two groups was also statistically significant at $p<0.001$.

Figure III-1: Change in Knowledge of AWWs Regarding Methods of Breastfeeding



Note**: Paired t–test IG:-3.514**, CG:-1.167; Independent t-test Pre: 1.184, Post: 4.470 *p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Regarding methods of breastfeeding, the CG-Supervisor listed 9/11 signs of attachment, positioning and suckling reflex as compared to only 5/11 signs by IG-Supervisor, post capacity building. This reflects low involvement of IG-Supervisor in the IMNCI training, as well as, the capacity building trainings of IG-AWWs, where methods of breastfeeding were discussed several times, using flip charts and role plays. With reference to the knowledge of Supervisors on other breastfeeding practices; the knowledge of IG-Supervisor, regarding production of more breast milk at night improved as compared to post capacity building. The CG-Supervisor had adequate knowledge in this regard, pre and post capacity building.

There was no improvement in the knowledge of the IG-Supervisor, regarding

breastfeeding in side lying position by mother, even though one of the flip chart given to AWWs clearly explained various positions in which mother can breastfeed the baby, included the side lying position. The IG-Supervisor only mentioned that mothers can breastfeed in side-lying position, if she is sick, whereas, the CG-Supervisor had adequate knowledge in this regard pre and post capacity building.

The IG-Supervisor had complete knowledge regarding the use of both breasts during each breastfeeding, whereas, the CG-Supervisor believed "not to give both breast until the child is hungry". Also, both the Supervisors agreed to start breastfeeding the baby from alternate breast every time; however, the IG-Supervisor mentioned that use of alternate breast is more important in small children since older children may use both breast every time.

Bottle feeding

Bottle feeding was observed in the AWC areas of both *Sejas*. Possible disadvantage of bottle feeding and its impact on malnutrition was discussed several times with AWWs during capacity building trainings and *Seja* meetings. As presented in Table III-6, there was a significant ($p<0.05$) improvement in knowledge of IG-AWWs (pre and post), as well as between the two groups post capacity building.

Table III-6: Change in Knowledge of AWWs Regarding Bottle feeding

Bottle Feeding	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Safe to bottle feed after properly cleaning the bottle (No)	50 (9)	65 (11)	56 (10)	76 (13)
Reason for avoiding bottle feeding				
1) Breast refusal due to nipple confusion	6 (1)	-	56 (10)	-
2) Reduce in mother's own milk supply	6 (1)	6 (1)	11 (2)	-
3) Babies more prone to infections	61 (11)	59 (10)	72 (13)	59 (10)
Mean Score	1.22 ± 0.732	1.29± 0.588	1.89± 0.758	1.35± 0.702
Independent T-test	-0.319 NS		2.166*	
Paired T-test	IG: -2.608* and CG: -0.324 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

The knowledge of IG-Supervisor improved post capacity building, and she could list 2 out of 3 key reasons for not advocating bottle feeding.

Supervisor's Responses	
IG	
Pre	***Post***
Plastic is harmful; 'salaha apvani nathi, bottle na dudha ni salaha apvani nathi' – We can't advice on giving bottle feeding and bottle milk	*Baby starts refusing the breast due to more efforts in breastfeeding.* *Plastic of bottle is harmful; bottle should never be used.* *If required it should be boiled for 20 minutes*
CG	
Bottle has bacterial which affects child digestions and diarrhea, child doesn't forget bottle soon	*Nipple rubber – 'badaknu tadavu undu thaya jaya'; Reduce bonding between mother and child*

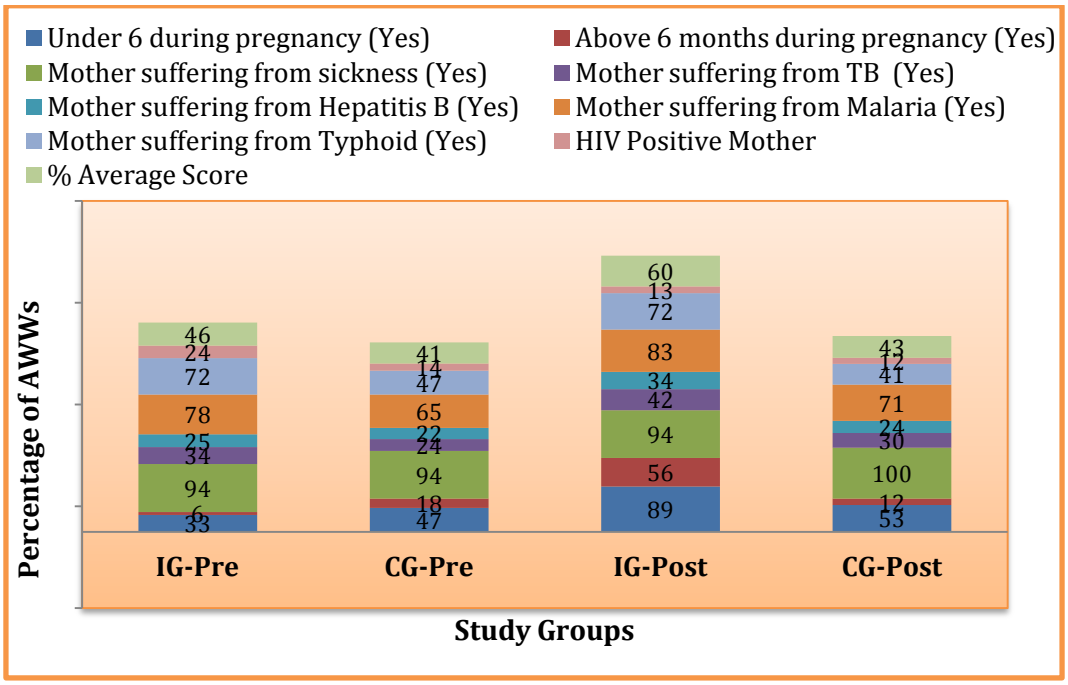
Breastfeeding during Pregnancy and Illness of Mother

Post capacity building, the mean knowledge score of IG-AWWs, with reference to breastfeeding during pregnancy and illness of mother improved significantly by 31.9% ($p<0.01$) as compared to CG-AWWs (6.6%). Also, post intervention mean knowledge score of AWWs from two groups was statistically different ($p<0.05$). As presented in, Figure III-2 most of the IG-AWWs started advocating breastfeeding during pregnancy and during some major illness like typhoid, malaria, hepatitis-B and tuberculosis.

As presented in Figure III-2 and Table III-7 the knowledge score of IG-AWWs, regarding breastfeeding by HIV positive mother also showed a small improvement, with 6% IG-AWWs advocating not to give any mixed feeding. The percent AWWs advocating animal feed or some replacement feed reduced among IG, whereas, among CG most of them only recommended replacement feeding for HIV positive mother.

None of the AWWs, pre and post capacity building, mentioned about giving replacement feeding only if it is acceptable, feasible, affordable, sustainable, and safe; feeding from other mothers/relatives breast milk; expressed breast milk and then feeding the baby after heating the milk. The low focus of AWWs on feeding during HIV may also be, since many of them may not have seen any such cases in their respective area.

Figure III-2: Change in Knowledge of AWWs Regarding Breastfeeding during Pregnancy and Illness



*Paired t-test IG: -3.053**, CG:-0.808; Independent t-test Pre: 0.706, Post: 2.293**
*p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Table III-7: Change in Knowledge of AWWs on Breastfeeding by HIV Positive Mother

Breastfeeding by HIV Positive Mother	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
– No mixed feeding	-	-	6 (1)	-
– Exclusive breastfeeding	22 (4)	12 (2)	11 (2)	-
– Replacement feeding, Animal feed; – No breastfeed ; give top milk	50 (9)	29 (5)	22 (4)	35 (6)
– As per doctors/nurse advice	28 (5)	24 (4)	50 (9)	6 (1)
– Don't know/Not sure	5 (1)	-	-	-

The knowledge of Supervisors remained similar to baseline. Both the Supervisors agreed on continuation of breastfeeding during typhoid, malaria, tuberculosis and

hepatitis-B, whereas, none of them mentioned about vaccinating baby or giving any kind of medicine to baby or mother during any of the illness.

The response to breastfeeding during pregnancy remained same as baseline with IG-Supervisor supporting breastfeeding during pregnancy till six months and later to stop breastfeeding with more food, whereas the CG-Supervisor totally denied breastfeeding even for children below six months.

With reference to breastfeeding during HIV, post capacity building, there was improvement in knowledge of CG-Supervisor, but it was not adequate. The IG-Supervisor knowledge regarding breastfeeding during HIV continued to remain poor even though this had been covered during capacity building.

Breastfeeding during Problems of Breast

As presented in Table III-8, the mean knowledge score of IG-AWWs regarding breastfeeding during breast problem improved significantly by 40.4% ($p<0.01$) as compared to CG-AWWs, where a non-significant improvement of 3.8% was noted.

Table III-8: Change in Knowledge of AWWs Regarding Breastfeeding during Breast Problems

Breast Problems and Suggested Treatment	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Cracked nipple				
Breastfeed the child / continue breastfeeding	33 (6)	53 (9)	67 (12)	41 (7)
Give top milk / no breast feed	6 (1)	6 (1)	6 (1)	47 (8)
Apply hind milk on the nipple/breast milk	6 (1)	35 (6)	50 (9)	35 (6)
Correct positioning and attachment during breastfeeding	-	-	11 (2)	-
If pain is unbearable then express milk	22 (4)	18 (3)	28 (5)	6 (1)
Go to hospital/consult doctor	53 (10)	47 (8)	33 (6)	59 (10)
Breast Engorgement				
Express milk	11 (2)	24 (4)	39 (7)	6 (1)
Give hot water compress on breast	22 (4)	41 (7)	17 (3)	47 (8)
Go to hospital/consult doctor	78 (14)	47 (8)	67 (12)	65 (11)
Breast abscess				
Needs to be removed surgically	17 (3)	-	6 (1)	-
Mother can continue to breastfeed baby from the same side after surgery	-	-	11 (2)	-
Mother can breastfeed from another breast which is free from abscess	22 (4)	6 (1)	22 (4)	-
Go to hospital/consult doctor	72 (13)	82 (14)	83 (15)	76 (13)
Mean Score	2.89 ± 1.079	3.12± 1.495	4.06± 1.434	3.24± 0.903
Independent T-test	-1.258 NS		2.011 NS	
Paired T-test	IG: -2.930** and CG: -0.489 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

The knowledge of IG-Supervisor regarding breastfeeding with cracked nipple and breast engorgement showed improvement, whereas, no such impact was observed in CG-Supervisor. However, along with appropriate responses, the IG-Supervisor also mentioned about inappropriate practice of cleaning nipple with hot water.

Further, both Supervisors were not able to give correct response about what to do in case of breast abscess. However, it was noteworthy that the CG-Supervisor did give correct response to this, at baseline also, which may be the result of some training or orientation received by CG-Supervisors, before the baseline.

3. Complementary Feeding

Introducing optimal complementary feeding (CF) practices is a very important window of opportunity to prevent undernutrition among all children below 2 years. Improving knowledge about the optimal CF practices was a challenge in the entire capacity building; correct knowledge about CF would help the AWW to impart the correct messages to the mother to ensure a smooth transition from breastfeeding to breastfeeding and CF.During the capacity building, the IG-AWWs were convinced to use standardized key messages on CF, printed in *MAMTA* card, to ensure consistency, quality in messages given to mother's and care providers, as well as, mother's could refer back if she forgets what to give and how much to give. Further, based on key issues identified at baseline, the IG-AWWs were also provided with key messages related to CF practices, which were recommended to be used during the IPC sessions. Besides this, to fully prepare the IG-AWWs to address the field issues related to CF, a flip chart on IYCF and a measuring glass was provided to the AWWs to explain to the mothers, about the quantity of various food items required to meet their child's current requirement.

a) *Age of Initiation of Complementary Feeding*

All the AWWs in both the groups, pre and post capacity building, were aware of the age of initiation of CF. There was no change in the knowledge of AWWs regarding the reason behind initiation of CF from 7th month onwards; 78% IG-AWWs and 76% CG-AWWs believed correctly that '*after six months of age mother's milk is not sufficient to meet the growing infant needs'*.

Further, the knowledge score of IG-AWWs regarding appropriate age for giving family food i.e. around 1 year, improved, post capacity building, from 17% (3) to 61% (11), whereas, among CG-AWWs the knowledge score improved from 35% (6) to 47% (8) post capacity building respectively. Overall, the mean knowledge score

improved significantly for IG-AWWs (1.89 to 2.39, p<0.05).

Finally, the improvement in awareness among the IG-AWWs (1.00 to 1.67, p<0.05) regarding age of continued breastfeeding along with CF remained significantly better than CG AWWs (0.82 to 1.12), even though, there was improvement among AWWs of both the groups (Table III-9). Also, though there was improvement in knowledge of all AWWs, only one CG-AWW post capacity building recommended continuing breastfeeding till 2 years and ***beyond***, which is also a very important message.

Overall, the knowledge of IG-AWWs remained better than CG-AWWs, with IG-AWWs listing 6/7 reasons behind continuation of breastfeeding till 2 years and beyond, as against CG-AWWs (2/7). These reasons are very important for convincing the community to continue breastfeeding for 2 years and beyond. The key reasons listed by AWWs were '*Breastfeeding is a vital source of energy and nutrients into 2nd year of life*' (IG 22%, CG 0%), '*Child can't eat everything so child gets all missing nutrients from mother's milk/child may not like all the kind of CF which is being offered to him'* (IG 22%, CG 18%) *and 'Continuation of breastfeeding till 2 years and beyond would ensure regular growth and timely achievement of milestone'* (IG 22%, CG 0%).

Table III-9: Change in Knowledge of AWWs Regarding Continuation of Breastfeeding along with Complementary Feeding

Indicators	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Age of Continuation of Breastfeeding with CF				
– 2 yrs and beyond	17 (3)	6 (1)	-	6 (1)
– Upto 2 years	39 (7)	59 (10)	67 (12)	76 (13)
Number of Reasons listed by AWWs#				
0	61.1 (11)	82.4 (14)	27.8 (5)	70.6 (12)
1	33.3 (6)	17.6 (3)	44.4 (8)	29.4 (5)
2	5.6 (1)		27.8 (5)	
Mean Score	1.00 ± 0.907	0.82± 0.728	1.67± 1.029	1.12± 0.697
Independent T-test	-0.128 NS		1.837 NS	
Paired T-test	IG: -2.287* and CG: -1.319 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

*# **Note**: None of the AWW mentioned that Breast milk is a key source of good quality proteins/ essential fatty acids and or vital micronutrients like Vitamin A/ Calcium and Riboflavin/ Vitamin-C*

Both Supervisors correctly specified the appropriate reason for initiating CF, from 7th month onwards, as well as were aware of the reason for continuation of breastfeeding till 2 years and beyond. However, the Supervisors gave incorrect

answer with regard to the age of giving homemade food, as around 6 months. Post capacity building the reasons stated by Supervisors were adequate for convincing community on continuation of breastfeeding, the IG-Supervisor stated: "*Can't take adequate diet so need to continue breast milk*" and, CG-Supervisor stated: "*Breast milk meets needs of nutrition not provided from CF. Breast milk ensures best weight gain and prevents malnutrition*".

b) *Type and Consistency of Foods to be served as Complementary Foods*

One of the key focuses of the capacity building with reference to CF was to explain, show and teach, the IG-AWWs, about the correct type and consistency of CF. Thin, liquid, low protein and low calorie CF will fill child's stomach, but not ensure adequate nutrition. Special messages were formulated and repeated several times on this.

Post capacity building the IG-AWWs listed food items from all food groups, whereas, no such improvement was noted in CG-AWWs. Also, as presented in Table III-10, the number of food groups listed by any single AWW improved among IG-AWWs from 6 food groups at baseline to 9 food groups post intervention, whereas, in CG the improvement was from 4 food groups at baseline to 5 food groups post intervention.

More homemade food items were recommended by IG-AWWs (44%) as compared to, CG-AWWs (12%). It was disturbing to note that even after the training received by IG-AWWs, 28% still listed low calorie liquid food items like *dal* water etc. However, this was much higher among the CG-AWWs (88%). The CF recommended by IG-AWWs included more protein energy dense foods as compared to CG AWWs. Overall, the mean knowledge score improved significantly among IG ($p<0.01$) as compared to baseline and was also significantly higher than the CG ($p<0.001$), post intervention.

Similarly, as presented in Figure III-3, more IG-AWWs correctly graded the food items which were non-appropriate for children 6-11 months, when list of food items was administered to AWWs.

Post capacity building, the IG-Supervisor recommended only 5 and CG-Supervisor listed 7 of 16 complementary food groups which also included breast milk, *Balbhog* and vegetable soup, the later one not very much recommended. Although IG-Supervisor covered less number of food groups, she did mention that CF should include *sheero, rotla*, *rotli* mixed in dense *dal* or milk and rice (*bhat*), whereas, the CG-Supervisor only mentioned *sev* with milk, which is not regularly served in Indian homes as CF. Further, the IG-Supervisor did specify that the CF should have right consistency and should be easy to digest, as well as, include a variety of food items,

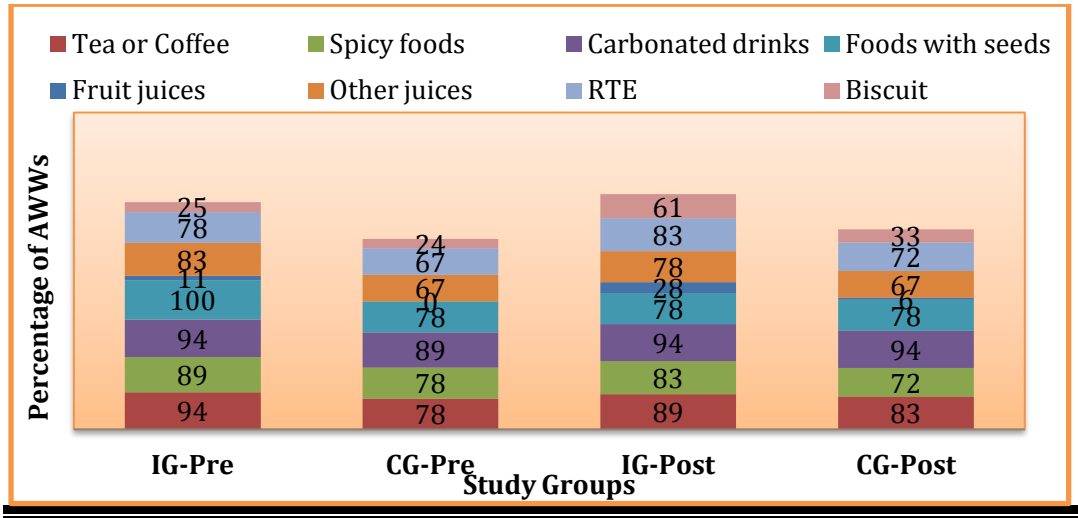
whereas, CG-Supervisor shared the same three attributes (nutritious, fresh and hot and hygienic) listed at baseline and additonaly mentioned that CF should be soft.

Table III-10: Change in Knowledge of AWWs regarding Consumption of Various Foods Groups as Complementary Food

Indicators	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Number of Food Groups listed by AWWs				
0	11.1 (2)	23.5 (4)		17.6 (3)
1 to 5	77.8 (14)	76.5 (13)	33.3 (6)	82.4 (14)
6 to 9	11.1 (2)	-	66.7 (12)	-
Min, Max	0,6	0,4	3, 9	0,5
Quality				
Home Made Food	28 (5)	18 (3)	44 (8)	12 (2)
Recipes				
Balbhog / AWC Snacks	22 (4)	29 (5)	11 (2)	24 (4)
Rab, sheera, dense liquids, kheer; Medium / Dhili Rab; Khichadi / rice, Masdelo (mashed) bhaat; Dudh(milk) rotli, rotlo / dudh sev; Jadi(thick) dal; Masdeli (mashed) rotli; Baafeli (boiled) dal, mashed rice and dal; Sev; Roti / Bhakhri/Muthiya/Dhebra	28 (5) 4 type)	65 (11) 4 type	94 (17) 9 type	94 (16) 7 type
Incorrect Answer				
# Any liquid like dal, mug water/ thin rab/ rice water/ soup/ juice/ liquids	83 (-15)	59 (-10)	28 (-5)	88 (-15)
Mean Score (including food to be avoided)	7.44 ± 3.072	7.59± 3.572	13.28± 1.873	7.06± 2.331
Independent T-test	0.895 NS		8.726***	
Paired T-test	IG: -5.987** and CG: 0.556 NS			

**p<0.05, **p<0.01, ***p<0.001 all others statistically non-significant # incorrect response scored negative for average score; ** p<0.01; NS: Not significant*

Figure III-3: Change in Knowledge of AWWs Regarding Foods to be Avoided by Children 6-11 months (Non-Appropriate)



c) *Frequency, Quantity and Consistency of Complementary Foods*

The second important key message during the capacity building with regard to CF was about frequency, quantity and consistency of complementary foods. As presented in Table III-11, the knowledge of IG-AWWs about appropriate frequency, quantity and consistency of CF for children 6-12 months and 1-2 years, improved post capacity building; however no such impact was noted among CG-AWWs. Overall, significant differences were noted between the mean knowledge scores of the two groups post intervention, however the difference was mainly due to significant reduction in mean knowledge score of CG AWWs, along with marginal improvement in IG.

Table III-11: Change in Knowledge of AWWs Regarding Frequency, Quantity and Consistency of Complementary Foods

Complementary Foods	Responses	Pre		Post	
		IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
6 to 12 months					
Frequency	Three times	50 (9)	47 (8)	78 (14)	35 (6)
	If not breastfeed than five times	50 (9)	47 (8)	11 (2)	-
Quantity	One bowl (250 ml) each time	44 (8)	24 (4)	67 (12)	-
Consistency	Mashed and/or thick / dense	78 (14)	76 (13)	83 (15)	71 (12)
	Finger foods by 8 mo.	6 (1)	-	-	-
1 to 2 years					
Frequency	Five times	67 (12)	65 (11)	72 (13)	29 (5)
Quantity	One and half bowl each time	28 (5)	6 (1)	22 (4)	-
	Half of adults portion	11 (2)	6 (1)	6 (1)	6 (1)
Consistency	Family food	72 (13)	94 (16)	94 (17)	82 (14)
Quality – 6 months to 2 years					
Right consistency '*Khaa sake tevu*'		28 (5)	12 (2)	78 (14)	24 (4)
Soft '*dhilo*'		61 (11)	76 (13)	67 (12)	82 (14)
Easy to digest		28 (5)	-	11 (2)	12 (2)
Inexpensive / Locally available / Culturally acceptable / Easily prepared at home		-	6(1)	-	-
Nutritious / Calorie dense /Add oil and ghee/protein rich		28 (5)	29 (5)	28 (5)	-
Fresh and hot		28 (5)	-	11 (2)	12 (2)
Hygienic/boiled		33 (6)	47 (8)	6 (1)	35 (6)
In correct Response: Thin/ Liquid/fruit		22 (-4)	6 (-1)	6 (-1)	18 (-3)

Complementary Foods	Responses	Pre		Post	
		IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
6 to 12 months					
juice#					
	Mean Score	5.89 ± 2.494	5.29± 1.16	6.33± 1.283	3.76± 1.348
	Independent T-test	0.190 NS		5.776***	
	Paired T-test	IG: -0.784 NS and CG: 6.260***			

*# Incorrect response scored negative for average score; *p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Among the Supervisors, both had correct knowledge about the frequency, quantity and consistency of complementary foods for children 6 to 12 months. The knowledge of IG-Supervisor was accurate; whereas, quantity recommended by CG-Supervisor was little less, 150-200 ml. The CG-Supervisor also mentioned consistency as semi liquid which was not an appropriate answer.

The IG-Supervisor's knowledge on the frequency, quantity and consistency, for children 1-2 years, improved post capacity building, which is very important for prevention of malnutrition, whereas, the CG-Supervisor still continued to specify lesser quantity than recommended.

d) *Feeding Children during and after Illness*

Guidelines on feeding during illness were emphasized and discussed during the capacity building. Even the messages formulated for CF included special ones related to feeding during illness. The guidance specifically included continued breastfeeding during illness, giving small frequent meals, giving what the child likes, giving variety of nutritious diets, feeding child patiently and encouraging child to take lots of fluid. Similarly, with reference to care after illness guidance specifically included, continued breastfeeding after illness and giving more food, more number of times, more nutritious with love and patience was emphasized and repeated in the key messages.

Improvement was reported among IG-AWWs regarding, the key messages about feeding during illness, i.e., feeding small and frequent meals (28% to 50%), and continued breastfeeding (6% to 17%). Similarly, with reference to feeding after illness, there was an increase in percent IG-AWWs who recommended feeding extra meal and extra amount after illness (Table III-12). However, the overall knowledge score of AWWs increased for both the groups, and was marginally (non-significant) better for CG-AWWs, with reference to feeding after illness.

Table III-12: Change in Knowledge of AWWs Regarding Feeding Child during Illness

Knowledge and Perceptions	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Feeding Child During Illness				
Encourage the child to drink and to eat - with lots of patience, use of toys	33 (6)	12 (2)	28 (5)	18 (3)
Feed small amounts frequently	28 (5)	18 (3)	50 (9)	18 (3)
Give foods that the child likes	17 (3)	24 (4)	33 (6)	41 (7)
Give a variety of nutrient-rich foods; GLVs; Milk; Mashed/ fruits; Mashed vegetables	22 (4)	41 (7)	22 (4)	29 (5)
Continue to breastfeed / breastfeed more	6 (1)	6 (1)	17 (3)	12 (2)
Give easily digestible foods like *khichadi/ milk roti*	37 (7)	29 (5)	28 (5)	47 (8)
Soft foods like *rab, dal bhat*	22 (4)	24 (4)	22 (4)	53 (9)
Hygienic and fresh	17 (3)	24 (4)	17 (3)	12 (2)
Mean Score	1.83 ± 1.150	1.76± 0.97	2.17± 1.15	2.29± 1.263
Independent T-test	1.514 NS		-0.312 NS	
Paired T-test	IG: -0.766 NS and CG: -1.412 NS			
Feeding child recovering from illness				
Feed an extra meal	39 (7)	6 (1)	44 (8)	12 (2)
Give extra amount; Slowly increase feed amount	17 (3)	18 (3)	67 (12)	24 (4)
Use extra rich foods / nutritious food, give fruits, GLVS, milk	33 (6)	29 (5)	28 (5)	12 (2)
Give extra breastfeeds as often as child wants	6 (1)	6 (1)	-	-
Continue breastfeeding	6 (1)		6 (1)	
Routine food; Homemade food	28 (5)	24 (4)	33 (6)	59 (10)
AWC snacks	-	-	-	12 (2)
Hygienic (food, hands and utensils)	11 (2)	12 (2)	6 (1)	12 (2)
Mean Score	1.39± 0.85	0.94± 0.899	1.83± 0.924	1.29± 0.92
Independent T-test	-0.892 NS		1.730 NS	
Paired T-test	IG: -1.365 NS and CG: -1.102 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Among the Supervisors, the knowledge about feeding during illness improved for the CG-Supervisor. The CG-Supervisor recommended continued breastfeeding during illness and giving small frequent meals, which was very important. However, the IG-Supervisor, despite capacity building, did not mention this important care while feeding during illness. The knowledge of IG-Supervisor regarding feeding after illness improved post capacity building. She did mention increasing the number of meals and quantity of meals, which was important to recover from illness. No such improvement was seen in CG-Supervisor.

e) *Methods to Promote/Encourage Complementary Feeding*

Regarding the techniques to encourage child while giving CF, post intervention 94% IG-AWWs as compared to 88% CG-AWWs recommended encouraging the child while feeding and 28% IG-AWWs as compared to 24% CG-AWWs also recommended to talk to child while feeding. Overall, the number of techniques recommended by any single IG-AWWs improved from 3 to 4, whereas among CG-AWWs maximum technique recommended by any AWW remained as 3.

As presented in Table III-13, post capacity building, 88.9% IG-AWWs graded 5 to 6 out of 6 complementary feeding behaviors correctly as compared to 55.6% at baseline. Contrary to this, among the CG-AWWs, the percent AWWs grading 5 to 6 out of 6 complementary feeding behaviors correctly reduced from 82.4% at baseline to 52.9% post capacity building.

Table III-13: Change in Knowledge of AWWs Regarding Techniques for Encouraging Child to Eat

Indicators	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Number of techniques recommended by AWWs for Encouraging Child to Eat				
0	-	5.9 (1)	-	-
1 to 3	100 (18)	94.1(16)	94.4 (17)	100 (17)
4 to 5	-	-	5.6 (1)	-
Min, Max	1,3	0,3	1,5	1,3
Behaviors regarding complementary feeding				
Number of Correct responses by AWWs				
3 to 4	44.4 (8)	17.6 (3)	11.1 (2)	47.1 (8)
5 to 6	55.6 (10)	82.4 (14)	88.9 (16)	52.9 (9)
Min, Max	3,6	4,6	3,6	3,6
Ways to Encourage Child Completing the Served Portion				
Do not force feed	-	12 (2)	11 (2)	12 (2)
Try giving food with different type	5 (1)	6 (1)	17 (3)	-
Different consistency / taste	-	-	-	-
Encourage the child to eat	50 (9)	29 (5)	39 (7)	47 (8)
Mean Score	6.28± 1.32	6.65± 1.115	7.00± 1.188	6.35± 0.996
Independent T-test	0.627^{NS}		1.740^{NS}	
Paired T-test	IG: -1.725^{NS} and CG: 0.651^{NS}			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Playing, talking, storytelling and showing TV were the ways listed by the Supervisors for encouraging child to take CF. The methods not listed included; feed infants directly, assist older toddlers to eat, be sensitive to hunger, be sensitive to satiety cues, feed patiently, don't force feed, minimize distractions during meals, maintain eye contact, if child refuses, experiment with different food combinations, tastes,

textures, never leave the child alone to eat. This again shows a very limited approach, knowledge and involvement of Supervisors in promoting CF.

Similar to baseline, post capacity building the Supervisors graded all 6 CF behaviors correctly. With reference to the knowledge of Supervisors when the child refused to eat, none of the Supervisors mentioned persistence in feeding the child with required quantity of food, experimenting with taste, consistency of CF food items to ensure that child takes required quantity of food. The IG-Supervisor did mention about encouraging the child, whereas, the CG-Supervisor suggested trying after some time; which may not be a practical option for village mothers loaded with house work and also the mothers may tend to forget.

4. Care During feeding

There was no improvement in listing the care practices during feeding the child. Overall, the AWWs continued to list around 9 out of 11 care practices during feeding, whereas the Supervisors continued to list 3 to 4 out of 11 care practices. The maximum number of care practices during feeding listed by any single AWW remained at 5 among IG-AWWs and 4 for CG-AWWs (Table III-14). The most common care practice listed were, '*Notice progress and how much is eaten*' (IG 78%, CG 41%) and '*Ensuring cleanliness while feeding'* (IG 89%, CG 82%).

Further, the IG-AWWs continued to list 4 indicators for child being hungry, whereas, the CG-AWWs mainly listed only crying.

One of the key reasons for poor CF by families was poor appetite which parents expressed as 'child won't eat'. Special effort was made to explain to IG-AWWs to help identify such children, as well as, identify the reason behind it. However, the knowledge of AWWs with reference to child not feeling hungry did not show any improvement, in fact the IG-AWWs only listed sickness as compared to 3 reasons listed earlier. The knowledge of CG-AWWs remained similar to baseline (Table III-14).

Table III-14: Change in Knowledge of AWWs Regarding Care during feeding

Indicators	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Number of Care Practices during Feeding listed by AWWs				
0	5.6 (1)	-	-	5.9 (1)
1 to 3	83.3 (15)	88.2 (15)	77.8 (14)	88.2 (15)
4 to 5	11.1 (2)	11.8 (2)	22.2 (4)	5.9 (1)
Min, Max	0,5	0,4	0,5	0,4

Indicators	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Number of Care Practices during Feeding listed by AWWs				
Indicators that Child Is Hungry				
Cries	94 (17)	100 (17)	94 (17)	82 (14)
Child sucks fingers	17 (3)	6 (1)	33 (6)	-
Mouthing	17 (3)	-	6 (1)	-
Irritable/un-happy/thru observation	6 (1)	-	22 (4)	-
Reasons for Child not Feeling Hungry				
Fever	6 (1)	6 (1)	-	18 (3)
Micronutrient deficiency	-	6 (1)	-	-
Mouth lesions and Neck lesion	6 (1)	-	-	-
Stress	-	-	-	12 (2)
Child sick '*sarirama rog hoe*'	50 (9)	41 (7)	17 (3)	41 (7)
Mean Score	4.06 ± 1.589	3.76± 1.091	4.33± 1.414	3.71± 1.16
Independent T-test	1.007 NS		1.430 NS	
Paired T-test	IG: -0.772 NS and CG: 0.174 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

There was no change in supervisor's knowledge regarding care during feeding. The CG-Supervisor listed crying, sucking fingers, mouthing, whereas, the IG-Supervisor listed crying, being irritable, urination, as early signs of hunger. This showed better knowledge of CG-Supervisor than IG-Supervisor. Further, the Supervisors listed prolonged breastfeeding, sickness, more outside food and irregular feeding, as reasons for poor appetite. However none of the Supervisors could explain the interrelation of delayed introduction of CF and micronutrient deficiency or problems in children like mouth lesions, which would be important for convincing families to start CF at right age and/or treat children with poor appetite.

5. Growth Monitoring and Promotion

During the capacity building, persistent efforts were made to transform weighing exercise in the field into growth monitoring. The IG-AWWs were explained the series of steps to be followed in growth monitoring, as well as its importance for prevention of undernutrition. As presented in Table III-15, the knowledge of IG-AWWs regarding importance of weight monitoring improved post capacity building.

Further, post capacity building, the IG-AWWs listed all steps in GMP, whereas the CG-AWWs listed only 8/11 steps, missing out some important steps such as, asking mother/caregiver to come back and weigh the child next month. Majority of IG-AWWs listed plotting on MAMTA card (IG 78%, CG 41%), informing mothers about child's nutritional status (IG 89%, CG 71%) and counseling mother on IYCF practices (IG

78%, CG 76%) as key steps in GMP.

Overall, the mean knowledge score improved in IG by almost double, i.e. 13.3% as compared to 6.7% improvement in CG.

Table III-15: Change in Knowledge of AWWs Regarding Growth Monitoring and Promotion

Growth Monitoring and Promotion	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Frequency of weight monitoring				
Once every months/ *MAMTA DAY* (*=1)	83 (15*)	82 (14)	78 (14*)	76 (13)
Once in 15 days	17 (3)	6 (1)	17 (3)	24 (4)
Twice in months for G-3and G-4/sick child	17 (3)	35 (6)	6 (1)	29 (5)
Importance of weight monitoring				
Measure growth	53 (10)	29 (5)	78 (14)	65 (11)
Check child's nutritional status/grade; Know child's food intake - adequacy	39 (7)	24 (4)	56 (10)	47 (8)
Detect growth faltering /Identify danger signs in child	50 (9)	76 (13)	83 (15)	47 (8)
For giving appropriate advice based on child health status	39 (7)	24 (4)	39 (7)	24 (4)
Check child well being	33 (6)	29 (5)	33 (6)	59 (10)
Refer if weighed less	6 (1)	12 (2)	-	6 (1)
Number of Steps in GMP listed by AWWs				
0	-	-	5.6 (1)	-
1 to 4	77.8 (14)	94.1 (16)	61.1 (11)	88.2 (15)
5 to 7	22.2 (4)	5.9 (1)	33.3 (6)	11.8 (2)
Min,Max	2,7	2,5	0,7	1,5
Mean Score	6.67 ± 1.970	6.12± 1.111	7.56± 2.093	6.53± 2.004
Independent T-test	0.556 ^{NS}		1.480 ^{NS}	
Paired T-test	IG: -1.135^{NS} and CG: -0.876^{NS}			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*
Only once every month included for mean score

Among the Supervisors, the IG-Supervisor could articulate the benefits of growth monitoring better post capacity building as compared to CG-Supervisor, as well as as compared to her knowledge at baseline. Post capacity building, the knowledge and perceptions of Supervisors regarding steps after weighing remained the same. The positive impact was that the Supervisors showed persistent in informing mothers about the nutritional status of her child and counseling them on IYCF, which was the most important action after weighing the child.

Supervisors Response	
Pre	***Post***
IG	
To measure whether the child is growing adequately as per the age	*Weight monitoring helps knowing growth of the child and helps to counsel women if child is not growing properly*
CG	
Measure growth and give appropriate advice	*Measure growth and know whether child is growing well for the age*

6. Diet during Pregnancy and Lactation

Similar to baseline, all AWWs and Supervisors agreed that pregnant and lactating mothers require more diet. Further, more IG-AWWs believed that the requirement increased for the pregnant mothers and the growing baby, as well as, during the lactating period.

More AWWs from IG as compared to CG knew that during lactating period the requirement increases further, pregnant women needs to take more food for herself, pregnant and lactating women should consume more of nutrient dense, protein rich, fruits and vegetables, sprouts, milk and milk products. Post capacity building the mean knowledge score of IG was significantly ($p<0.05$) better as compared to CG (Table III-16).

Table III-16: Change in Knowledge of AWWs Regarding Reasons for Increase in Dietary Intake of Pregnant and Lactating Mother's

Reasons	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Take more food for her self	44 (8)	59 (10)	67 (12)	59 (10)
Take more food for baby/ healthy baby	95 (18)	94 (16)	100 (18)	94 (16)
During lactation period this requirement increases further	28 (5)	59 (10)	33 (6)	41 (7)
During pregnancy she needs to take at least one and half time more food than usual	22 (4)	-	11 (2)	-
Pregnant/ lactation mothers should take double food	39 (7)	41 (7)	33 (6)	18 (3)
Pregnant women should take balance diet which should include cereals, pulses, oils, fruits, vegetables and milk	33 (6)	12 (2)	17 (3)	6 (1)
o Chana, Cereals, Pulses	5 (1)	24 (4)	22 (4)	6 (1)
o Sprouts	33 (6)	53 (9)	39 (7)	41 (7)
o Milk and Milk Products	33 (6)	41 (7)	44 (8)	35 (6)
o Nuts and oil seeds	16 (3)	-	22 (4)	-
o Egg, Non-veg	21 (4)	6 (1)	22 (4)	6 (1)
o Jaggery	16 (3)	12 (2)	33 (6)	12 (2)

Reasons	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
o Ghee / oil	16 (3)	-	11 (2)	6 (1)
o Fermented foods# / Mug/ *khichadi*	6 (1)	-	6 (1#)	-
o Nutrient dense	28 (5)	-	17 (3)	6 (1)
o Rich in calories and proteins	-	-	6 (1)	6 (1)
Daily seasonal /green leafy vegetables	50 (9)	53 (9)	61 (11)	53 (9)
o Other Vegetables	5 (1)	6 (1)	11 (2)	18 (3)
Fresh Food	5 (1)	-	-	-
Daily seasonal /fruits	44 (8)	41 (7)	44 (8)	47 (8)
Only consume iodized salt	5 (1)	-	-	-
Mean Score	7.00± 2.722	6.59± 1.417	7.44± 2.175	5.94± 2.045
Independent T-test	1.322 NS		2.103*	
Paired T-test	IG: -0.634 NS and CG: 1.165 NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Among the Supervisors, the knowledge regarding diet during lactation and pregnancy and reasons behind it improved marginally in IG-Supervisor and remained more or less the same in CG-Supervisor.

7. Inter Personal Counseling (IPC)

During baseline it was seen that the AWWs and even the IG-Supervisor were very poor in IPC. Least efforts were seen in listing and understanding the actual problems of the beneficiary. Efforts were made to sensitize IG-AWWs and IG-Supervisor, during the capacity building, on the importance of making any IPC or BCC a two way process. Emphasis was not only on giving the messages for behavior change, but more on the way the AWWs delivered messages to beneficiary and especially on listening and helping mothers' address their issues/queries. As a result the IG-AWWs could list 5 out of 6 steps for effective IPC, whereas, the CG-AWWs listed only 3/6 steps (Table III-17). The overall change in mean knowledge score of IG-AWWs, pre and post, as well as, within two groups post intervention, was statistically significant at p<0.0.001.

Post capacity building, the IG-Supervisor could list first three of the five key steps in effective counseling in a more organized manner, whereas, the CG-Supervisor knowledge and perceptions remain same as baseline.

Table III-17: Change in Knowledge of AWWs regarding Inter Personal Counseling

Six steps for effective counseling / Appropriate Counseling techniques	Pre		Post	
	IG % (N=18)	CG % (N=17)	IG % (N=18)	CG % (N=17)
Listen and reflect back	11 (2)	-	50 (9)	-
Praise the mother wherever appropriate	11 (2)	-	39 (7)	6 (1)
Ask checking questions	26 (5)	18 (3)	61 (11)	35 (6)
Ensure attention of mother / attentive	-	6 (1)	-	6 (1)
Empathiz with her (e.g. in pain or anxious)	-	-	6 (1)	-
Offer necessary help if necessary	-	-	6 (1)	-
Mean Score	0.50± 0.707	0.24± 0.437	1.61± 1.092	0.47± 0.514
Independent T-test	0.565 NS		3.913***	
Paired T-test	IG: -3.986*** and CG: -1.725NS			

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant*

Discussion: Impact of capacity building on the knowledge, perceptions and practices of the *Anganwadi* workers and Supervisors

In the current study, the overall knowledge score of AWWs in IG improved significantly (p<0.001) by 35.4% (73.1 to 99.0), whereas in CG, the pre and post knowledge score improved by only 3.6% (69.4 to 71.9) respectively. Also, the difference between the knowledge score of IG and CG post intervention was statistically significant (p<0.001).

Overall, the mean knowledge score of IG-AWWs improved significantly for 15/24 indicators as compared to CG, where significant improvement was recorded for 2/24 indicators.The post capacity building mean knowledge score of IG-AWWs was better than CG for 21/24 indicators and significantly better for 11/24 indicators. The major improvement was noted among IG-AWWs regarding addressing mothers' query of "*Not Enough Breast Milk"*, IPC skills, EIBF, type of CF and continuation of breastfeeding along with CF which were also some of the major issues/challenges identified at baseline.

Among the Supervisors, the major change in IG-Supervisor was regarding her awareness of the importance of recommended practices. The IG-Supervisor was able to articulate the correct reasons behind adopting these recommended practices, which was the key focus of capacity building, so that these reasons percolated to AWWs, and benefit greatly in IPC with women and their families, to bring about

desired impact.

Although improvement in the IG Supervisors knowledge was satisfactory in around 7 of 12 areas, further improvement is required for prevention of undernutrition which can be achieved by similar on job capacity building, as well as, some changes in the Supervisors' work load, which gives more freedom to them to work on the focused area.

Though much research has been done on ICDS, extensive review reveals that studies assessing impact of capacity building on knowledge, perceptions and practices (KAP) of AWWs or the frontline workers (such as village volunteers, ANMs etc) are very few. The findings available from various studies, on different service providers, have shown positive and mostly significant impacts of trainings on KAP of service providers, as discussed below.

A recent study conducted on the effectiveness of training programme for ASHA on infant feeding practices in a rural teaching hospital in Nagpur, using pre-test and post-test assessment showed that, the training on the KAP regarding breastfeeding was found to be effective. The difference in the pre and the post test score of the participants was found to be statistically significant at $p<0.05$ (Thakre *et al.* 2012).

In Vadodara, a study by Daxini and Kanani 2009 showed that, capacity building was successful in improving the knowledge of the AWWs regarding ICDS services (including GMP, SF) and IYCF practices with the messages being well retained even one year after the intervention.

In 2009, Taksande *et al.* assessing the knowledge of health care workers after IYCF training in Gondia, found significant difference in the post-test scores. The ICDS Supervisor gained knowledge and skills regarding breastfeeding and CF after the training. The study concluded that there is a need for in-service training of Supervisor and other health workers/personnel, for updating their knowledge.

A Study in Brazil (Santos 2001), aiming to assess impact of IYCF related nutrition counseling component of the Integrated Management of Childhood Illness (IMCI) strategy showed, that the doctors in the IG with 12-13 patients <18 mo. had better knowledge of child nutrition and improved assessment and counseling practices. After training, doctors in the IG (n=17) on an average, correctly answered 83% questions related to nutritional counseling as compared to 68% doctors in CG (n=16), statistically significant at $p<0.05$.

Similar study on effectiveness of training on infant feeding practices among community influencers in a rural area of West Bengal showed that besides the initial training, successive reinforcement trainings were able to improve significantly the

community influencer's (n=34) knowledge regarding infant feeding practices. The authors recommended the need for not only instituting training, but also reinforcement for generating human resources on health care from within the community (Halder 2001).

In 1997, a study in rural Nigeria, by Davies and Adebawa, evaluated the strategy for training community health extension workers to promote EBF in a survey of 66 trained primary health care workers in the IFE south breastfeeding project area and 56 primary health care workers in seven non-intervention districts. In the study area the trained health workers had significantly better knowledge about breastfeeding than their untrained colleagues in both the study ($p<0.001$) and control areas ($p<0.001$), and more often recommended timely initiation and EBF than the CG ($p<0.001$). A multivariate analysis showed that the training programme and the study area were the only significant variables that were predictors of breastfeeding knowledge ($p<0.001$).

The findings of the current study on the effect of capacity building of AWWs on knowledge of IYCF is thus corroborated by that reported in others studies showing that appropriate education of health extension workers can contribute significantly towards their ability to promote optimal feeding practices. However, the actual impact on the community feeding practices and nutritional status may be variable, depending upon other situations such as programmatic priority, nutritional status of population, etc.

B. Impact of capacity building on undernutrition prevalence, and associated infant and young child practices of the care providers of the children under two years

This section addresses the following specific objective of the study;

- ✓ To assess impact of capacity building on undernutrition prevalence and associated infant and young child feeding practices of care providers of children under two years

The following section presents, impact of capacity building on the status of children under 2 years of age. The research findings are presented and discussed under the following heads:

A. Background Characteristics' of the Households
B. Infant and young child feeding practices
C. Utilization of Integrated Child Development Services for children under two

years

D. Nutritional status of children under two years

Profile of Sampled Households

During the study, around 330 households from each ICDS Supervisory Sectors (*Seja's*) covering a total of 17 AWC (CG) and 19 AWC (IG) were surveyed, pre and post intervention. This included around 280 households with at least one child under two years and 46 households with pregnant women in third trimester. The background characteristics of households was almost similar between the two groups, pre and post survey.

All the children (U-2 yrs) were assessed, in both the groups, for anthropometric measurement. Table III-18 presents, children covered pre and post intervention, in both the groups. The male and female ratio was around 50%, and the KAP subsample covered around 60% in both groups. Among these children, around 25% children, in both the groups, were LBW i.e., below 2.5 kg.

Follow-up of the children born to the pregnant women cohort (3rd trimester) was done till 1 year. As a result, around 65% children, born to the pregnant women assessed at baseline, were followed up at around 6-11 months. During the 2nd follow-up, at around 12-18 months, 87% follow-up in IG and 78% follow-up in CG was done respectively (Table III-18).

During the post intervention survey, anthropometric paired data was available for around 31% mother child pairs, in both the groups. Whereas, the KAP paired data was available for around 36%, mother and child pairs assessed, post intervention, respectively.

Table III-18: Background Characteristics of Children under two Years

	Pre		Post	
	IG % (N=468)	CG % (N=475)	IG % (N=489)	CG % (N=440)
Anthropometric Measurements				
Sex				
– Male	54.5 (255)	53.7 (255)	49.3 (241)	50.2 (221)
– Female	45.5 (213)	46.3 (220)	50.7 (248)	49.8 (219)
Age				
– 0 to 5 mo.	27.8 (130)	25.1 (119)	24.3 (119)	22.0 (97)
– 6 to 11 mo.	25.6 (120)	27.2 (129)	26.6 (130)	25.9 (114)
– 12 to 23 mo.	46.6 (218)	47.8 (227)	49.1 (240)	52.0 (229)
KAP study – Sub sample				
– Children 0- 23 mo.	61.5 (288)	60.4 (287)	62.2 (304)	63.4 (279)
– 0-5 mo.	110	118	115	95

	Pre		Post	
	IG % (N=468)	**CG % (N=475)**	**IG % (N=489)**	**CG % (N=440)**
– 6-23 mo.	178	169	189	184
Birth order				
– 1	-	-	46.1 (140)	41.2 (115)
– 2-3	-	-	48.6 (148)	48.4 (135)
– 4-5	-	-	4.6 (14)	8.3 (23)
– 6+	-	-	0.7 (2)	1.1 (3)
Sex				
– Male	54.2 (156)	57.1 (164)	50.7 (154)	48.4 (135)
– Female	45.8 (132)	42.9 (123)	49.3 (150)	51.6 (144)
Birth Weight	**230**	**221**	**238**	**224**
– < 2.5 kg (LBW)	20.9 (48)	28.5 (63)	26.5 (63)	25.4 (57)
– >= 2.5 kg	79.1 (182)	71.5 (158)	73.5 (175)	74.6 (167)
Pregnant Women – Cohort follow-ups				
– 1st (6-11 mo.)	-	-	64.2 (34/53)	65.5 (36/55)
– 2nd (12-18 mo.)	-	-	86.8 (46/53)	78.2 (43/55)
Mother and Child pair data				
– Anthropometry	-	-	31.5 (154/489)	31.4 (138/440)
– KAP interview	-	-	36.2 (110/304)	37.3 (104/279)

Infant and Young Child Feeding Practices

a) *Breastfeeding*

Knowledge and Perceptions of Breastfeeding Practices

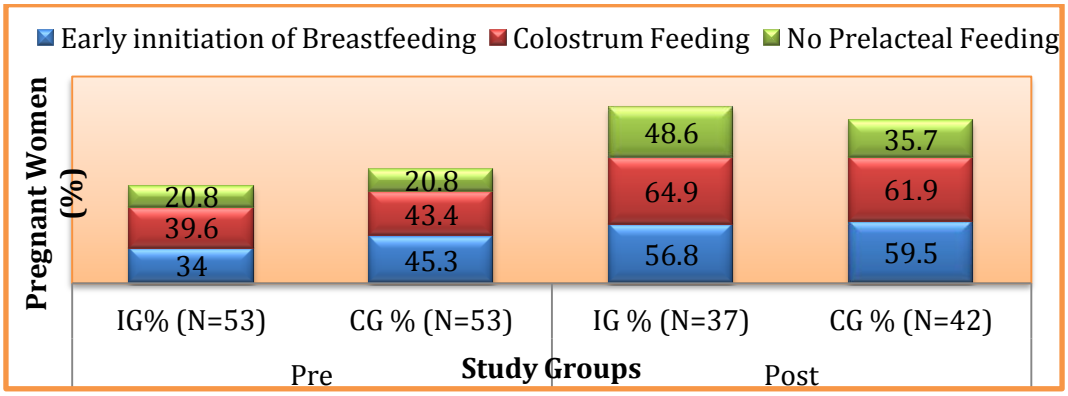
During the capacity building, the IG-AWWs were explained the importance of counselling pregnant and lactating women, as well as, were comprehensively trained, on enhancing community based optimal breastfeeding practices. The impact of capacity building on the knowledge and perceptions of pregnant and lactating mother's about breastfeeding is discussed in these sections.

Early Breastfeeding Practices

As presented in Figure III-4, the knowledge and perceptions of pregnant women on the early breastfeeding practices improved. The improvement in knowledge related to EIBF, colostrum feeding and prelacteals feeding was 35.7% (67.1 vs. 31.3%), 21.3% (63.9% vs. 42.6%) and 0.6 times (1.3 times vs. 0.7 times) better in IG as compared to, CG respectively. The improvement reported in IG, on all 3 early breastfeeding practice, was statistically significant; EIBF $p<0.05$, colostrum feeding

p<0.05 and no prelacteal feeding p<0.01 (Annexure 13).

Figure III-4: Impact of Capacity Building on Knowledge and Perceptions of Pregnant Women on Early Breastfeeding Practices



Statistically signification improvement within IG (x^2 4.61 p<0.05, 5.55 p<0.05 and 7.76 p<0.01), for all 3 practices and non-significant improvement for CG - corrected x^2 used

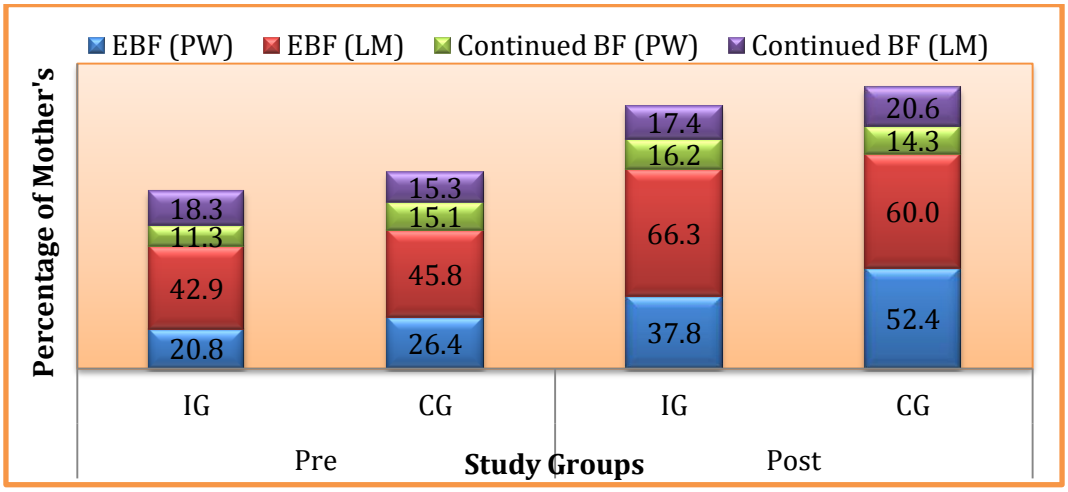
Exclusive Breastfeeding and Continued Breastfeeding

Post intervention, there was improvement in knowledge of pregnant and lactating women regarding EBF, whereas, with reference to continued breastfeeding till 2 years and beyond, marginal decline was noted among CG-PW and IG-LM (Figure III-5) respectively.

As compared to CG, the knowledge of IG lactating mothers, improved regarding EBF by 23.5% more (54.5% vs. 31%) and IG pregnant women on continuation of breastfeeding by 48.7% more (↑43.4% vs. ↓5.3%). However, the knowledge of pregnant women on EBF and lactating mothers on continuation of breastfeeding, improved more in CG as compared to IG.

Overall the improvement regarding knowledge on EBF was significantly better for IG (p<0.001) as compared to CG (p<0.01) lactating mothers (Annexure 14), whereas, among pregnant women the improvement was statistically significant, in CG with reference to the duration of breastfeeding by p<0.01 (Figure III-5).

Figure III- 5: Impact of Capacity Building on Knowledge and Perceptions of Pregnant and Lactating Mothers' on Exclusive Breastfeeding and Continued Breastfeeding



***Note**: PW: Pregnant Women and LM: Lactating Mothers'*
Statistically significant improvement in CG-EBF (PWandLW) (x^2 6.71 $p<0.01$ and 7.05, $p<0.01$) and IG-EBF (LM) (x^2 20.26, $p<0.001$), persons x^2 used

Breastfeeding Frequency, Duration and Adequacy

Among the lactating mothers as compared to CG, the improvement in IG regarding their knowledge about breastfeeding on time schedule, as well as, minimum frequency of breastfeeding in a day, was higher by 4.9% (20.0% vs. 15.1%) and 33.2% (39.1% vs. 5.9%) respectively (Table III-19). Also the mean breastfeeding frequency recommended by lactating mothers improved significantly among IG from 8.98±3.76 to 9.59±3.42, $p<0.01$ as compared to, CG from 9.67±3.70 to 9.72±4.37 respectively (Annexure 15). Further, knowledge regarding minimum duration of each breastfeed, showed a marginal improvement only among IG-lactating women (↑9.9%).

As presented in Table III-19, on assessing the knowledge and perceptions of mother's, regarding use of both breasts, during each breastfeeding and use of alternate breast each time, there was marginal improvement in both groups, and improvement was statistically significant for CG lactating women and IG pregnant mother about "Use of alternate breast during each new breastfeed" by $p<0.01$.

Lastly, the knowledge and perceptions of mothers, on deciding, whether her milk is adequate for the baby, remained extremely poor, pre and post intervention, despite repeated discussion with IG-AWWs, to address this important issue.

Overall, post capacity building the appropriate response related to breastfeeding frequency, duration and adequacy improved in IG pregnant and lactating women by 4.1% (12.9% vs. 8.8%) and 10.5% (13% vs. 2.5%) more than CG.

Table III-19: Impact of Capacity Building on Knowledge of Pregnant and Lactating Mother's on Breastfeeding Frequency, Duration and Adequacy

Appropriate Responses	Pre		Post	
	IG % (N=53)	CG % (N=53)	IG % (N=37)	CG % (N=42)
Pregnant Women				
1. Breastfeeding on a time schedule	49.1 (26)	45.3 (24)	67.6 (25)	64.3 (27)
2. Breastfeeding on demand day and night	41.5 (22)	45.3 (24)	29.7 (11)	33.3 (14)
3. Breastfeeding 8 – 12 times in a day (BF frequency)	24.5 (13)	30.2 (16)	29.7 (11)	42.9 (18)
4. Breastfeeding minimum 20- 30 minutes each time (BF duration)	24.5 (13)	24.5 (13)	18.9 (7)	19.0 (8)
5. Offer another breast, after one breast is empty/child leaves one breast	83.0 (44)	90.6(48)	89.2 (33)	97.6(41)
6. Breastfeeding every time from different breasts	62.3 (33)	79.2 (42)	86.5 (32)	85.7 (36)
Appropriate Response (%)	47.5	52.5	53.6	57.1
Indicators about "Not Enough Breast Milk"				
• Weight	1.9 (1)	-	-	-
Lactating Mothers'	**N=175**	**N=177**	**N=190**	**N=170**
1. Breastfeeding on a time schedule	68.0 (119)	75.7 (134)	81.6 (155)	87.1 (148)
2. Breastfeeding on demand day and night	28.0 (49)	23.2 (41)	16.8 (32)	12.9(22)
3. Breastfeeding 8 – 12 times in a day (BF frequency)	38.6 (66)	47.2 (83)	53.7 (102)	50 (85)
4. Breastfeeding minimum 20- 30 minutes each time (BF duration)	26.3 (46)	32.2 (57)	28.9 (55)	21.2 (36)
5. Offer another breast, after one breast is empty/child leaves one breast	86.9 (152)	92.1 (163)	88.9 (169)	96.5 (164)
6. Breastfeeding every time from different breasts	76.0 (133)	81.4 (144)	83.7 (159)	92.9 (158)
Appropriate Response (%)	52.2	58.6	58.9	60.1
Indicators about "Not Enough Breast Milk"				
• Weight	-	-	0.5 (1)	-

** p-value<0.05, ** p-value<0.01, ***p<0.001. Pearson's x^2 used*

Note: Statistically significant ***improvement*** *for IG-LW indicator 1**, and 3**, CG-LW indicator 1** and 6** practice; statistically significant* ***reduction*** *among LW of both groups regarding indicator 2* and CG indicator 4*; statistically significant* ***improvement*** *IG-PW regarding indicator 1*, and 6***

Benefits of Breastfeeding

As presented in Figure III-6 and Figure III-7 the improvement in knowledge of pregnant and lactating women about benefits of breastfeeding was noted in both groups. Post intervention, the knowledge of pregnant women on benefits of breastfeeding was better in IG as compared to CG, whereas, among lactating mothers, although the knowledge of IG women improved as compared to baseline, but the overall, score remained better for CG, similar to baseline.

Figure III-6: Knowledge of Pregnant Women about Benefits of Breastfeeding – Post Intervention

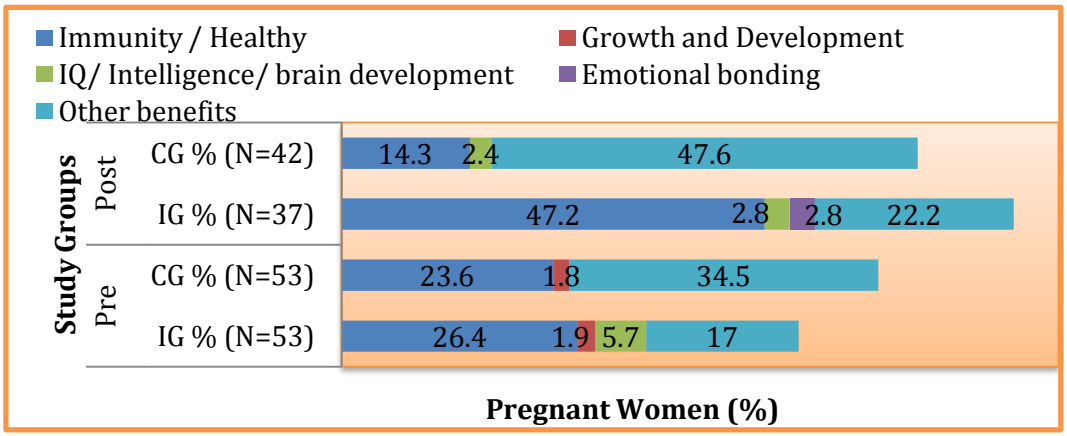
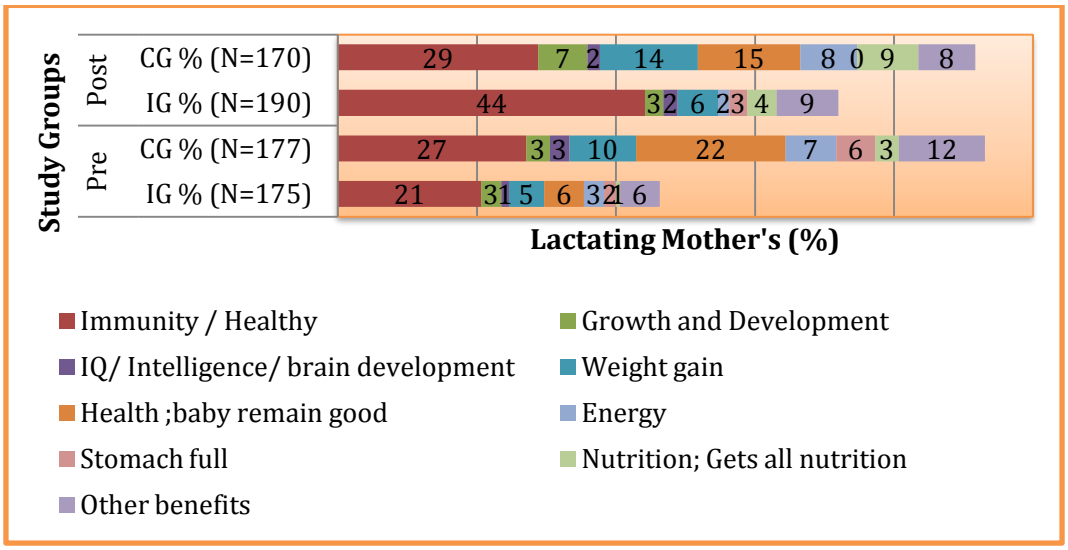


Figure III-7: Knowledge of Lactating Mother's about Benefits of Breastfeeding – Post Intervention



Breastfeeding and Mother's health

Among pregnant women the knowledge improved significantly within both the groups for one indicator each. However, if we look at the overall improvement, the improvement was better in IG by 17% (32.5% vs. 15.5 %) (Table III-20). Among

lactating mothers improvement was significant for 3 out of 4 indicators within IG and CG respectively. The overall improvement was better in CG by 10.8% (18.8% vs. 29.6 %).

Table III-20: Impact of Capacity Building on Knowledge of Pregnant and Lactating Mother's on Breastfeeding and Mothers' Health

Appropriate Responses	Pre		Post	
Pregnant Women	**IG % (N=53)**	**CG % (N=53)**	**IG % (N=37)**	**CG % (N=42)**
1. Mother should take extra diet during pregnancy and Lactation	37.7 (20)	67.9 (36)	64.9 (24)	69.0 (29)
2. Breastfeeding help in delaying the next pregnancy	13.2 (7)	11.3 (6)	21.6 (8)	28.6 (12)
3. Mother should/can continue to feed the child even when she is pregnant again	34.0 (18)	18.9 (10)	21.6 (8)	14.3 (6)
4. Breastfeeding helps mothers' to lose weight	39.6 (21)	56.6 (30)	56.8 (21)	66.7 (28)
Appropriate Response (%)	**31.1**	**38.7**	**41.2**	**44.7**
Lactating Mothers	**N=175**	**N=177**	**N=190**	**N=170**
1. Mother should take extra diet during pregnancy and breastfeeding	73.1 (128)	83.6 (148)	84.2 (160)	90.0 (153)
2. Breastfeeding help in delaying the next pregnancy	9.1 (16)	10.7 (19)	17.9 (34)	21.8 (37)
3. Mother should/can continue to feed the child even when she is pregnant again	26.9 (47)	20.3 (36)	20.5 (39)	32.4 (55)
4. Breastfeeding helps mothers' to lose weight	35.4 (62)	40.7 (72)	48.9 (93)	57.1 (97)
Appropriate Response (%)	**36.1**	**38.8**	**42.9**	**50.3**

** p-value<0.05, ** p-value<0.01, ***p<0.001. Pearson's x^2 used*

***Note**: Statistically significant improvement for IG-LW indicator 1**, 2* and 3**, CG-LW indicator 2**, 3* and 4**; statistically significant improvement in IG-PW indicator 1*, CG-PW indicator 2**

- ***Counseling on Breastfeeding Practices***

During the capacity building, the IG-AWWs were explained and trained for using the opportunities for antenatal checkup and post natal IMNCI visits, to counsel the mothers and her family member on optimal IYCF practice.

ANC Checkup and Breastfeeding Counseling

During the study it was observed that the ANC checkup during pregnancy remained almost same as baseline, in both the groups, however, the percentage of women who received counseling on breastfeeding increased significantly, p<0.001 (Table III-21).

Table III-21: Impact of Capacity Building on Breastfeeding Counseling during ANC Checkup

		ANC Checkup % (N)	Breastfeeding Counseling % (N)#	ANC vs. Breastfeeding Counseling				
				>=1#	1	2	3	>3
Pre	IG (N=173)	96.5 (167)	67.1 (116)	68.9 (115/167)	64.3 (9/14)	63.2 (12/19)	52.6 (10/19)	73.0 (84/115)
	CG (N=179)	98.9 (177)	74.9 (134)	78.4 (134/171)	66.7 (2/3)	28.6 (2/7)	80.0 (4/5)	80.8 (126/156)
Post	IG (N=193)	98.4 (190)	89.6 (173)	99.4 (167/185)	25.0 (1/4)	100.0 (1/1)	100.0 (1/1)	91.4 (160/175)
	CG (N=170)	98.2 (167)	79.4 (135)	81.2 (134/165)	25.0 (1/4)	100.0 (1/1)	-	82.5 (132/160)

 # Statistically signification improvement in IG women (p<0.001) corrected x^2 used

Sources of Counseling and Key Messages on Breastfeeding

Among the IG, the counseling by AWWs, on IYCF during pregnancy, improved by around 7.9 time (p<0.001) as compared to, baseline, whereas, in CG, no improvement in counseling, on IYCF by AWWs, during pregnancy was reported (Table III-22). Further the counseling by IG-AWWs, improved for all four key counseling points (p<0.001).

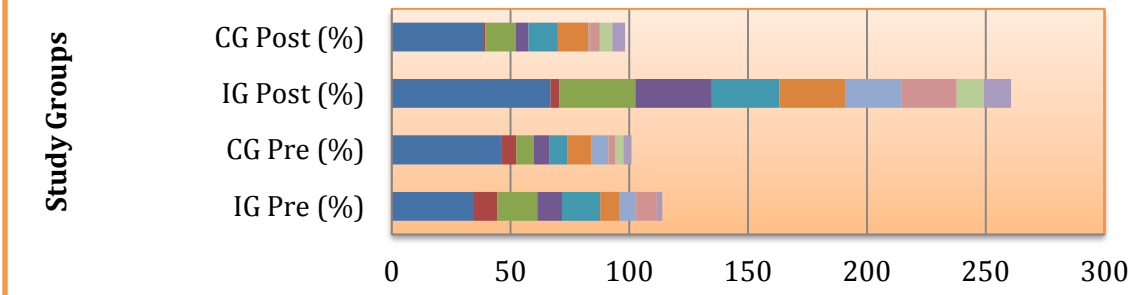
Also, the counseling by AWWs, after child birth increased in the IG for all indicators related to IYCF. The average mothers receiving counseling on IYCF increased by 2.4 times in IG and 1.1 times in CG. The only indicator where a reduction was seen was in relation to expression of breast milk, in both the groups. As presented in Figure III-8, the counseling on GMP, by AWWs, after child birth, reduced by 32.2% in CG as compared to, 92.8% improvement in IG, respectively.

Table III-22: Impact of Capacity Building on Counseling about Breastfeeding during Pregnancy

Lactating Mothers' (Children Below 1 year)	Pre		Post	
	IG % (N=173)	CG % (N=179)	IG % (N=193)	CG % (N=170)
Counseling on IYCF(Yes)* **	67.1 (116)	74.9 (134)	89.6 (173)	79.4 (135)
Place of Counseling (all sources)				
– *MAMTA DAY* ** (SC, PHC, AWC, school)	47.4 (82)	62.0 (111)	72.5 (140)	46.5 (79)
– Home	-	4.5 (8)	11.9(23)	20.0(34)
– AWC	-	-	0.5(1)	-
Counseling by AWWs* **	8.7 (15)	21.2 (38)	68.9 (133)	17.1 (29)
Counseling points covered by AWWs* **				
– EIBF (within 1 hour)	13.4 (15)	27.3 (38)	76.7 (132)	21.6 (29)
– Colostrums feeding	16.7 (10)	28.2 (29)	79.0 (124)	21.5 (28)
– No prelacteal feed	19.1 (13)	24.3 (25)	79.7 (126)	22.3 (29)
– Exclusive breastfeeding	19.2 (14)	27.7 (31)	79.0 (128)	21.5 (28)

*Corrected x^2 used; *** Statistically signification improvement among IG-LM (p<0.001); ** Statistically signification (P<0.01) reduction among CG-LM*

Figure III- 8: Impact of Capacity Building on IYCF and GMP Counseling After Child Birth by AWWs



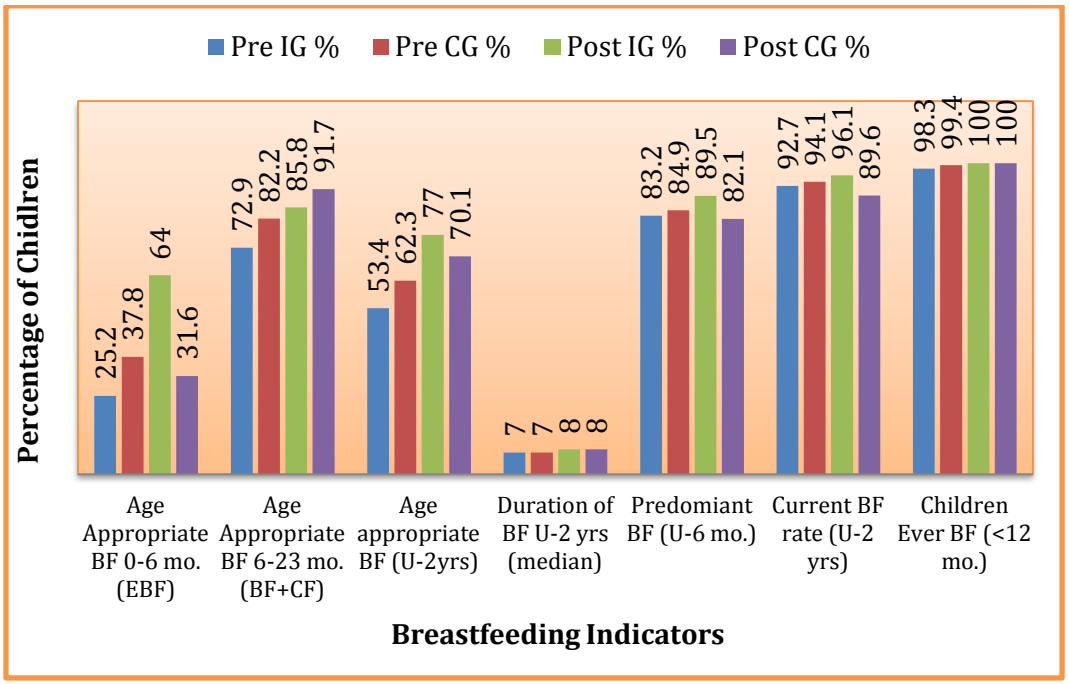
	IG Pre (%)	CG Pre (%)	IG Post (%)	CG Post (%)
GMP	35	46	67	39
Expression of breast milk	10	6	4	1
BF Attachment	17	7	32	13
Exclusive Breast Feeding	10	7	32	5
BF Positioning	16	7	29	12
Keep baby warm	8	10	28	13
Kangaroo Mother Care	7	7	24	1
No Prelactal Feed	9	3	23	4
Colustrum Feeding	0	3	11	5
EIBF	2	3	11	5

***Note**: BF-Breastfeeding, EIBF-Early Initiation of Breastfeeding and GMP-Growth Monitoring and Promotion*

- ***Children Ever Breastfed***

Overall, post capacity building all four key indices on breastfeeding status improved better for IG as compared to, CG. The major improvement was in age appropriate feeding rate, which improved 1.4 times in IG (53.4% to 77%) as compared to 1.1 in CG (62.3% to 70.1%). Also, as presented in Figure III-9, although the status of age appropriate breastfeeding among 6-23 months was better in CG, the percent improvement in IG was 6.1% more (117.7% vs. 111.6%) as compared to CG.

Figure III-9: Impact of Capacity Building on Breastfeeding Status



- ***Early Breastfeeding Practices***

There was a 28.7% more improvement in EIBF rates among IG (65.4%, 100/153 to 88.7%, 157/177) as compared to, CG (80.8%, 135/167 to 86.4%, 133/154). Further, with reference to c-section, the EIBF rates did not show any improvement in IG (63.2%, 12/19 to 62.5%, 10/15). However, the EIBF rates continued to remain better for IG (62.5%, 10/15) as compared to, CG (50%, 9/18).

Also, the prelacteal feeding rates, reduced in the IG and CG by 22.3% (IG; 35.5%, 61/172 to 27.6%, 53/192) and 31.7% (CG; 38.5%, 69/179 to 26.3%, 45/171)) respectively. The colostrum feeding rates improved 3.9% more in IG (60.6%, 63/104 to 69.8%, 67/96) as compared to, CG (58.6%, 68/116 to 65.3%, 62/95).

Lastly, with reference to frequency of breastfeeding (below 6 mo.), which, may be useful to assess the adequacy of breastfeeding, it was noted that the mean number of breastfeeds per day improved by 0.7 (9.9±3.7 to 10.6±4.7) feeds in IG and 0.1

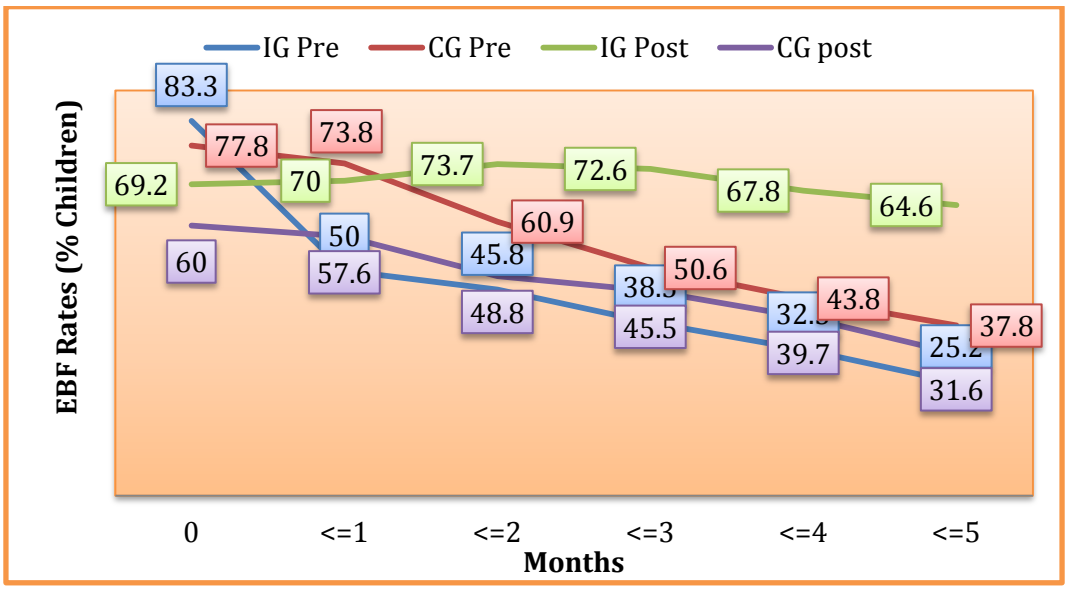
(10.9±4.3 to 11±5.0) feeds in CG, respectively. These results are based on responses of mothers who could quantify the frequency for day and night.

- ***Practice of Exclusive Breastfeeding and Continued Breastfeeding***

Exclusive Breastfeeding

Post capacity building, the EBF rate among children under 6 months increased in IG by 2.6 times ($p<0.001$) as compared to baseline, whereas, a marginal decline in EBF rates in CG was noted (Figure III-10).

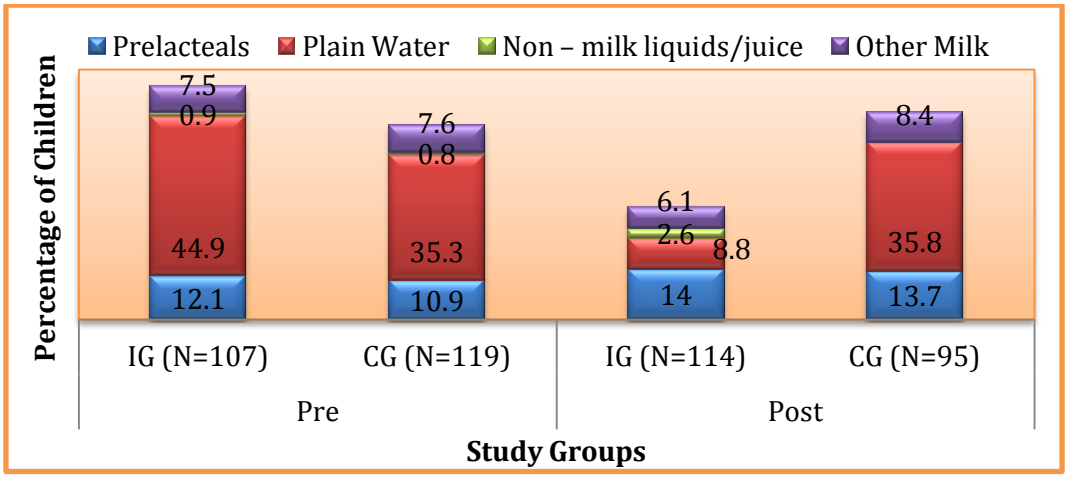
Figure III-10: Impact of Capacity Building on Exclusive Breastfeeding rate among children under 6 months



Note: *Statistically signification improvement among IG-EBF ($p<0.001$)*

Further, as presented in Figure III-11, post capacity building, the use of non-milk item among children under 6 months reduced in IG. The major impact was noted in the reduced use of plain water ($p<0.01$) and other milk in IG. Among the CG, no such impact was noted in use of non-milk items, in fact there was a marginal increase in use of prelacteals, plain water and other milk items.

Figure III-11: Impact of Capacity Building on Feeding of Non-breast milk items among children Under 6 months



Note: *Statistically signification reduction among IG children (p<0.01) in use of plain water*

Continued Breastfeeding

Assessing the continued breastfeeding rate in both the groups, post intervention, it was noted that, the continued breastfeeding rate at 1 and 2 years improved in IG by 11.5% at 1 year (85.3%, 29/34 to 95.1%, 39/41) and 12.3% at 2 years (67.6%, 25/37 to 75.9%, 22/29), whereas, in the CG, the rates declined by 11.3% (93.3%, 28/30 to 82.8%, 24/29) at 1 year and 7.1% (67.6%, 23/34 to 62.8%, 27/43) at 2 years; however, the change was statistically non-significant for both groups.

Bottle Breastfeeding

Post capacity building the bottle feeding-ever used rate reduced by more than 38.8% (8.5% to 5.2%) in IG, whereas in CG, marginal reduction of 2.4% (8.3% to 8.1%) was noted. Further, the current bottle feeding rate reduced in IG from 5.1% (9/177) to 4.7% (9/193) as compared to, a marginal increase in CG from 6.1% (11/181) to 7.6% (13/172) respectively, however, the change was statistically non-significant for both groups.

Problems in Breastfeeding

At baseline, 5.8% (IG, 6/103) and 11.1% (CG, 13/117) lactating mothers, with children under 6 months, had reported problems in breastfeeding. The problems reported included, sore nipples, breast abscess, breast engorgement and insufficient milk. Post capacity building, the problems in breastfeeding reported during the survey, reduced in both groups, to 3.5% (IG, 4/114) and 3.2% (CG, 3/95) respectively. The reduction in problem was statistically non-significant. However, almost all mother's having problems in breastfeeding (IG3/4, CG 2/3) stopped

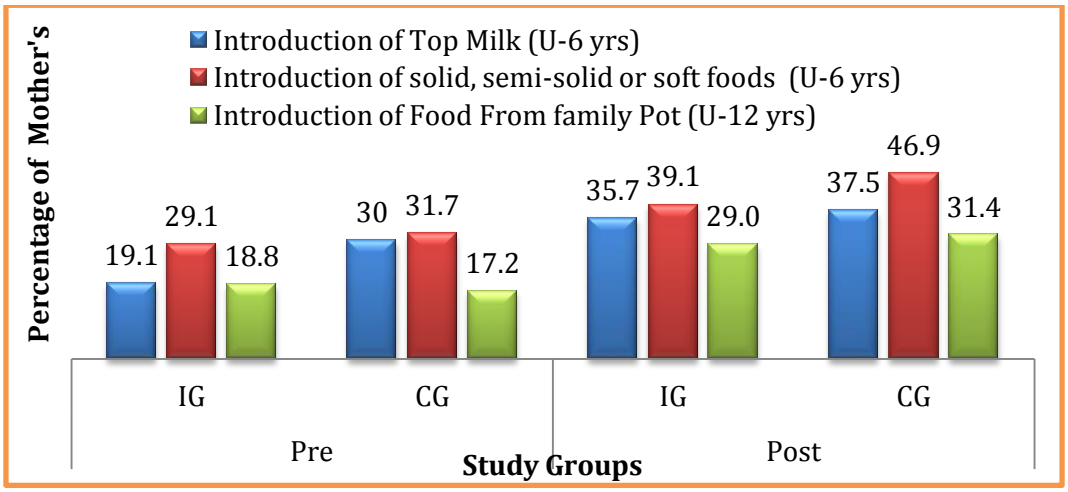
breastfeeding their child. No major conclusions could be drawn in this regard, due to limited number of cases identified during the study.

b) *Complementary Feeding*

Age of Introduction of Complementary Food

Pre and post capacity building, the knowledge and perceptions of mothers of children below one year were assessed on three aspects of age of introduction of complementary food (CF) i.e. age of introduction of top milk, solid and semi solid food and food from family pot or meal. As presented in Figure III-12, the knowledge of mothers from both groups showed improvement.

Figure III-12: Impact of Capacity Building on Knowledge of Mother's about Introduction of Complementary Foods



Note: *Statistically signification improvement among IG regarding introduction of top milk (x^2 7.73, $p<0.01$) and introduction of food from family pot (x^2 5.30, $p<0.05$) and among CG, regarding age of introduction of complementary food (x^2 6.80, $p<0.01$) and food from family pot (x^2 9.82, $p<0.01$). The age in parenthesis indicates age of children whose mother was assessed.*

Since the intervention was for 12 months, the caregivers of children 6-17 months at the time of post data collection would have received intervention based counselling about timely initiation of CF, hence the data of children 6-17 months of age has been analysed separately (Table III-23).

As presented in Table III-23, overall, post capacity building 6.4% (25.7% vs. 19.3%) and, 19.8% (12.6 vs. ↓7.2%, $p<0.05$) more children (6-17 mo.), were receiving top milk, and solid food in IG as compared to CG. The introduction of solid food at 6 months increased in IG by 86.9% (28.3% to 52.9%, $p<0.001$) as compared to 3.1% reduction in CG (44.6% to 43.2%). Among children 12-23 months, the introduction of solid foods between 6-8 months improved in IG, by 32.8% (50.9% to 67.6%, $p<0.05$)

as compared to around 13.6% (69.9% to 60.4%) reduction in CG. Also, the mean age of introduction of CF among children 6-17 months and 12-23 months improved significantly in IG by $p<0.05$ and $p<0.01$, respectively.

Table III-23: Impact of Capacity Building on Status of Initiation of Complementary Food

Status of Initiation of Complementary Food	Pre		Post	
	IG % (N=120)	CG % (N=112)	IG % (N=140)	CG % (N=125)
Top milk - 6 to 17 months				
• Receiving top milk	35.8 (43)	42.9 (48)	45.0 (63)	51.2 (63)
• Mean ± SD	7.00±4.75	7.48±4.36	6.60±3.29	6.98±3.22
Independent t-test	0.50^{NS}		0.66^{NS}	
Independent t-test	IG: 0.51^{NS} and CG: 0.69^{NS}			
Solid food - 6 to 17 months				
• Receiving solid food #	82.5 (99)	96.4 (108)	92.9 (130)	89.5 (111)
• Initiated solid food at 6th mo. ###	28.3 (34)	44.6 (50)	52.9 (74)	43.2 (54)
• Mean ± SD	7.41±2.47	6.74±1.79	6.80±1.85	6.87±1.90
Independent t-test	2.33*		-0.31 ^{NS}	
Independent t-test	IG: 2.15* CG: -0.53^{NS}			
Solid food - 12 to 23 months	**N=112**	**N=103**	**N=111**	**N=106**
– Introduced before 6 mo.	9.8 (11)	14.6 (15)	10.8 (12)	15.1 (16)
– Introduced between 6 to 8 mo. #	50.9 (57)	69.9 (72)	67.6 (75)	60.4 (64)
– Introduced beyond 8 mo.	33.9 (38)	15.5 (16)	18.0 (20)	19.8 (21)
– Mean ± SD	8.14±3.14	7.04±2.73	7.10±2.40	7.05±2.77
Independent t-test	2.69**		0.148^{NS}	
Independent t-test	IG: 2.71** CG:-0.03^{NS}			

** Significant at p<0.05, ** Significant at p<0.01; # IG Significant at p<0.05, ### IG Significant at p<0.001 correct x^2 used.*

***Note**: Only important and relevant responses included, hence the percent may not add upto hundred.*

- ***Responsive Feeding***

The knowledge of mothers on responsive feeding practice, showed a marginal positive trend in IG as compared to CG. Post capacity building, more mothers of children below 1 year, from IG (29.5% to 36.3%) believed that child can eat by him/herself around 2-3 years as compared to a decline in CG (40.3% to 25.6%). Similarly 83.9% mothers' with children below 2 years from IG, knew it was important to sit and monitor the child while eating as compared to 78% at baseline, whereas, in CG the knowledge improved from 88.2% to 91.4%.

Lastly, regarding mothers' response to "child refuses to complete the given food", 2 times more mothers' compared to baseline in IG (7.6%/ to 15.8%; $p<0.01$) as compared to, 1.7 times more mothers in CG (9.4% to 16.1% $p<0.05$) recommended

to encourage and feed the children (Annexure 14).

- ***Hand-washing by Children before Eating***

The knowledge of mothers (6-23 mo.) regarding washing hands before giving CF, improved in both the groups. Overall 12% (81.8% vs. 91.6%) more mothers in IG, and 19.7% (83% to 92.9% $p<0.05$) more mothers in CG considered hand-washing before CF, as important. However, 87% (29.9% vs. 55.9% $p<0.001$) more mother's in IG and 78% (37.1% vs. 61.8% $p<0.001$) more mother's in CG recommended hand-washing with soap and water before CF.

- ***Amount of Complementary Food***

As presented in Figure III-13 to Figure III-16, among the breastfed children (6-23 mo.), post intervention, the percent children consuming more quantity of CF per serving, increased in IG as compared to CG.

The percentage of children (6-8 mo.) not receiving any CF reduced significantly in IG by almost 2.4 times ($p<0.05$), whereas, percentage of children not receiving any CF increased in CG. Among 6-8 months improvement in intake of CF by 19.3% (30.5% to 36.4%-1-2 tsp) and 2.2 times (16.7% to 36.4% - 1/3rd bowl) was reported in IG as compared to CG where no such impact was noted.

Further, among the older children, it is important that the children consume at least one bowl per serving. Among IG children 12-17 months and 18-23 months, a 2.4 and 5 times ($p<0.01$) increase in consumption of full bowl or more was reported. In CG, the increase in consumption reported was 3.4 and 1.9 times, among 12-17 months and 18-23 months respectively, however, the increase was statistically non-significant.

Since there were very few non-breastfed children (6-23 mo.), this data was analysed for all children (6-23 mo.) as one group (Figure III-17) Post capacity building, there was a remarkable increase in the quantity of CF given to non-breastfed children in IG. Most of the children in IG were given 1/3rd to full bowl per serving, whereas, at baseline most of the children in IG were given 1/4th to half bowl per serving. In CG also, some change was observed, however, the change was not that remarkable.

Figure III-13: Quantity of Complementary Food Given to Breastfed Children – IG at Baseline

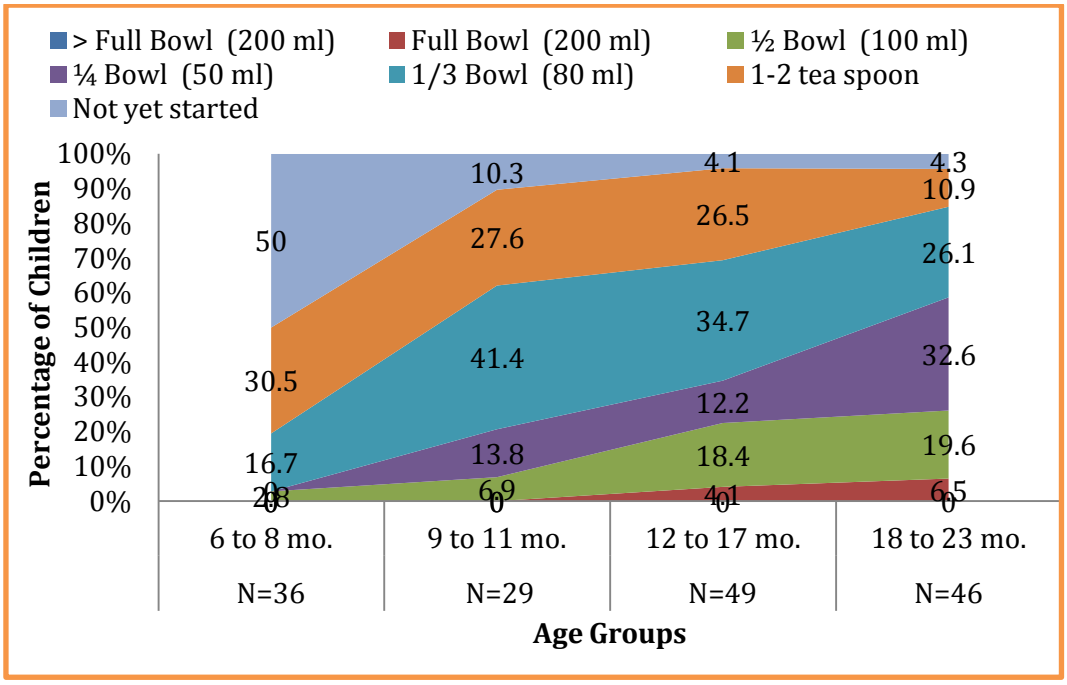
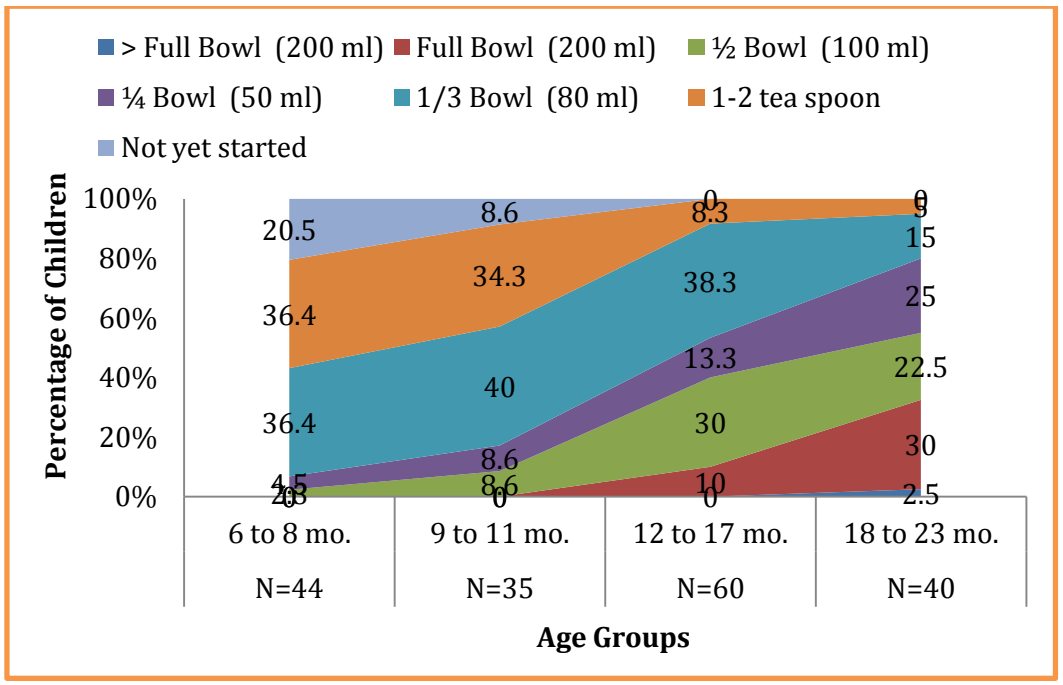


Figure III-14: Quantity of Complementary Food Given to Breastfed Children – IG Post intervention



Note: *Statistically significant improvement in consumption of full bowl among IG children 18-23 mo. p<0.01*

Figure III-15: Quantity of Complementary Food Given to Breastfed Children – CG at Baseline

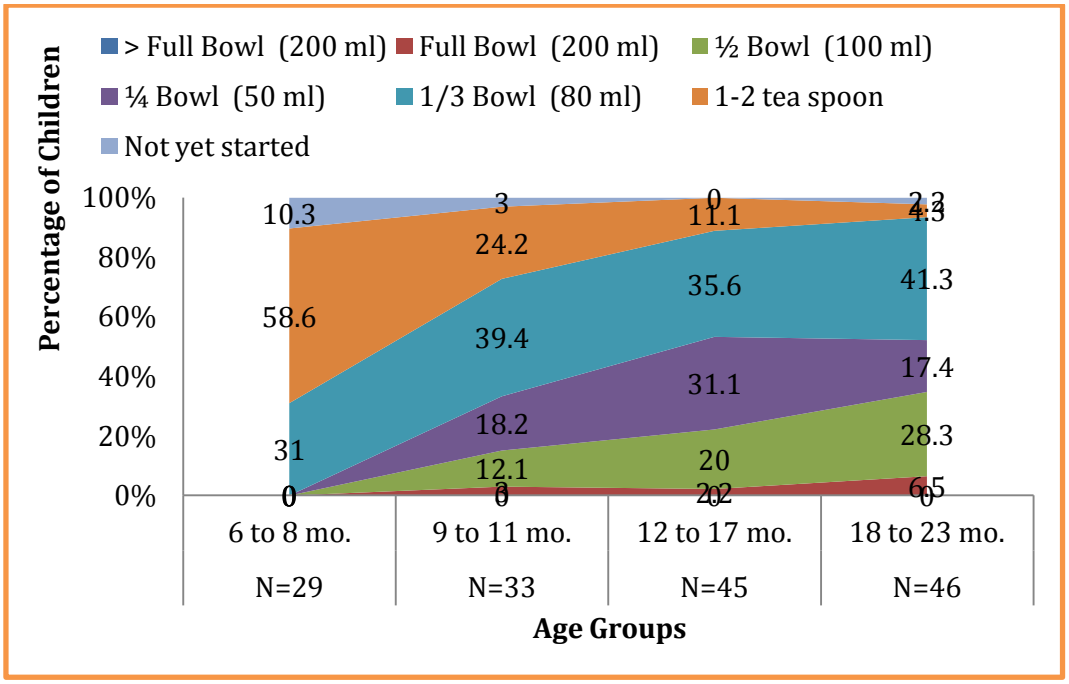


Figure III-16: Quantity of Complementary Food Given to Breastfed Children – CG Post Intervention

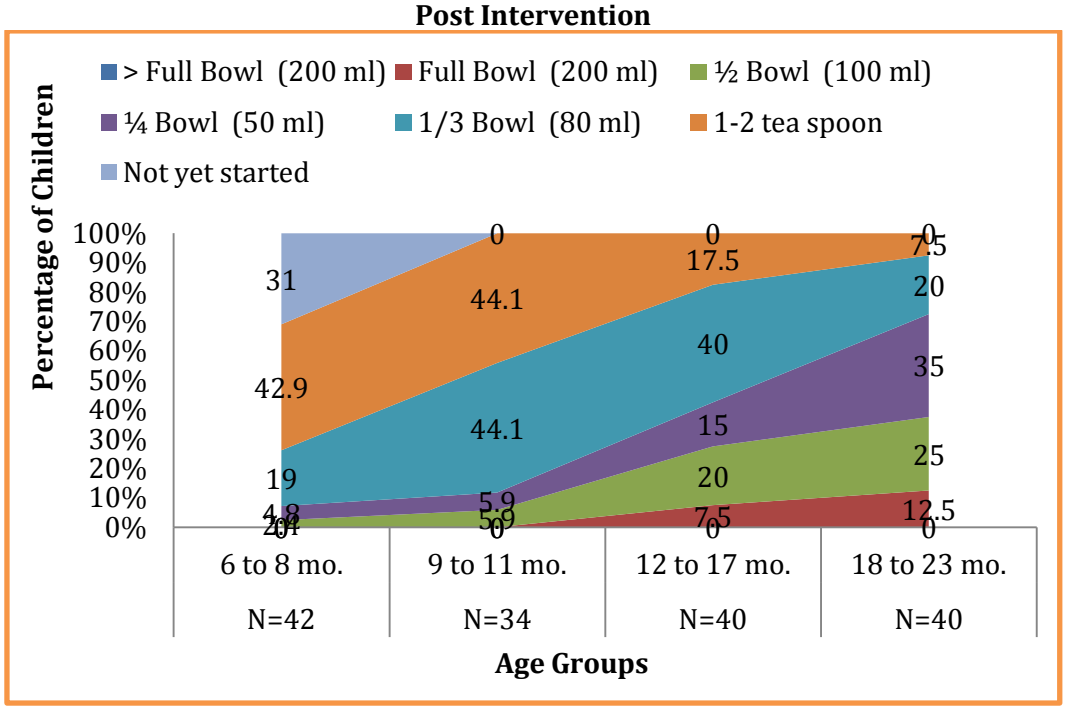
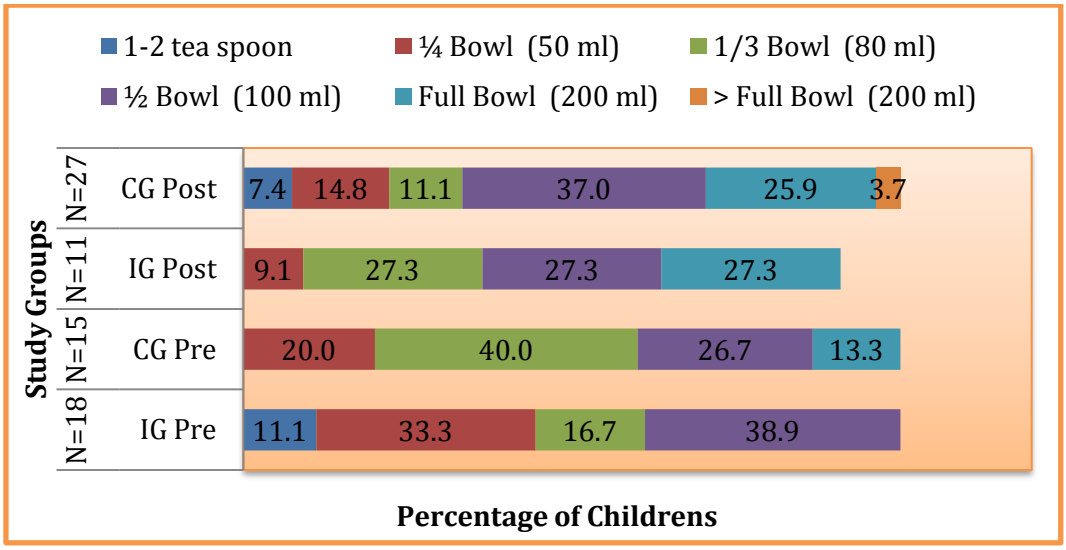


Figure III-17: Quantity of Complementary Food Given to Non-Breastfed Children (6-23 months)



Note: *Percent may not add upto hundred due to missing value*

- ***Food Consistency***

Post capacity building, as presented in Table III-24, the knowledge and perceptions of mothers about consistency of CF improved in IG, with more mothers recommending medium (53%) to thick (67.4%) consistency of CF, whereas, in CG, mothers' recommended thin liquid type, this being significantly higher by 1.4 times as compared to baseline.

Table III-24: Impact of Capacity Building on Knowledge and Perception's of Mothers about Consistency of Complementary Foods

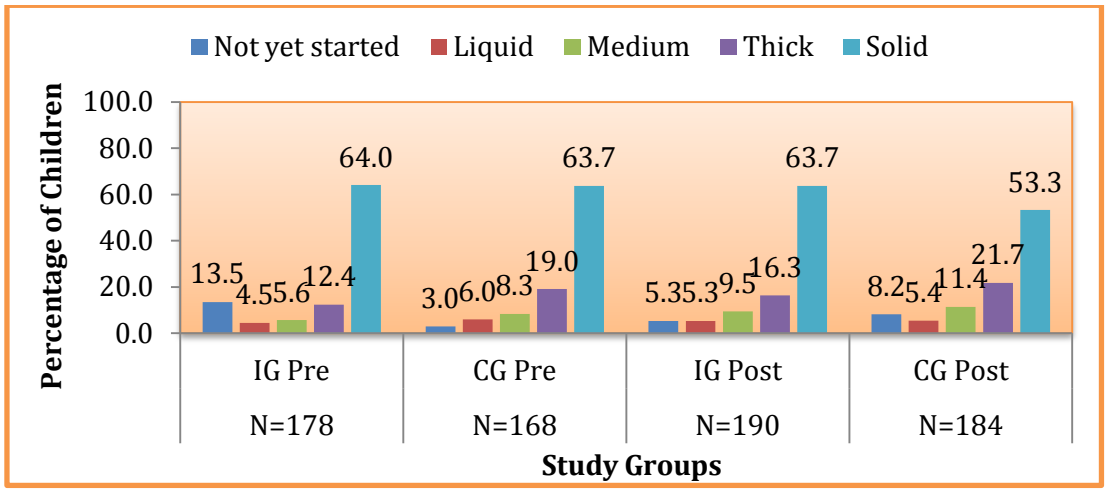
Knowledge of Mothers of Children Below 6 months	Pre		Post	
	IG % (N=110)	CG % (N=117)	IG % (N=115)	CG % (N=95)
Very thin (liquid)	60.9 (67)	28.2 (33)	55.7 (64)	40 (38)
Medium (thick but flows from spoon)	18.2 (20)	21.4 (25)	27.8 (32)	12.6 (12)
Thick (falls as lump from spoon)	3.6 (4)	7.7 (9)	6.1 (7)	2.1 (2)
Solid food	2.7 (3)	34.2 (40)	0.9 (1)	32.6 (31)

Note: *Percent may not sum to hundred due to missing values/ no response and responses such as don't know/ not sure.*
The difference between IG and CG mother's recommending medium consistency, statistically significant post intervention x^2 7.25 p<0.01

Assessing the actual practices of children 6-23 months (Figure III-18), it was noted that percentage of mothers, not giving CF reduced significantly (p<0.05) in IG (13.5% to 5.3%) and increased non-significantly in CG (3% to 8.2%) respectively. Also the percentage of children being offered CF with liquid, medium and thick consistency improved by 17.1%, 68.6% and 32% in IG; whereas the percentage of children

offered CF with medium and thick consistency improved only by 37% and 14.1% respectively in CG.

Figure III-18: Impact of Capacity Building on Consistency of Complementary Food Given to Children

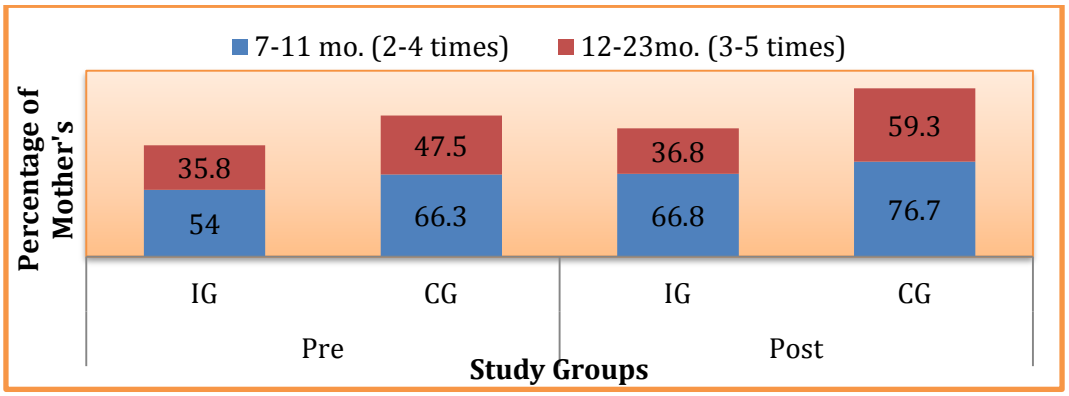


Note: *Statistically significant reduction among IG mothers not yet started CF, p<0.05*

- ***Meal Frequency and Energy Density***

As stated earlier, the *MAMTA* card recommends feeding children 7-11 months one bowl of CF three times a day and children 12-23 months with one and half bowl five times a day. The knowledge of mothers on feeding frequency improved in IG by 8% more as compared to CG, with reference to children 7-11 months; whereas, with reference to older children 12-23 months, the knowledge of CG mothers' remained better (Table III-25). Also, the knowledge improved significantly (p<0.05) for both CG children regarding CF frequency of children 7-11 months and 12-23 months and IG children regarding CF frequency 7-11 months, post capacity building (Table III-25).

Table III-25: Impact of Capacity Building on Knowledge of Mothers' about Complementary feeding frequency



Note: *Statistically significant improvement among IG, p<0.05, regarding CF freq 7-12 mo. (p<0.05) and CG, p<0.05, regarding CF freq 7-12 mo and 12-23 mo*

As presented in Table III-26, the minimum dietary diversity (MDD) i.e. percentage of children consuming at least 4 out of the 7 food groups reduced in both the groups. However, it was important to note that the mean score improved in IG from 2.3±1.63 to 2.6±1.36, whereas, in CG the mean score reduced from 2.7±1.25 to 2.6±1.47. Similar trend was noted among the breastfed children, whereas, among the non-breastfed children, the MDD score improved in CG as compared to a reduction in IG. Age-wise the MDD score improved among breastfed children (12-17 mo.) in both the groups. However, the improvement with reference to the mean values was better in IG (2.5±1.35 to 2.9±1.22) as compared to, CG (2.9±0.90 to 3.0±1.22) respectively.

Table III-26: Impact of Capacity Building on Minimum Dietary Diversity

Minimum Dietary Diversity	IG Pre	CG Pre	IG Post	CG Post
Total#	23.6 (42/178)	27.4 (46/168)	22.1 (42/190)	25.4 (49/183)
Mean ± SD	2.3±1.63	2.7±1.25	2.6±1.36	2.6±1.47
Independent t-test	-2.29*		0.00^{NS}	
Independent t-test	IG: -1.52^{NS} CG:0.95^{NS}			
Non-breastfed	50.0 (9/18)	57.1 (12/21)	46.2 (6/13)	60.0 (18/30)
Mean± SD	3.3±1.5	3.7±0.9	3.5±1.3	3.8±1.3
Independent t-test	-1.44^{NS}		-0.61^{NS}	
Independent t-test	IG:-0.50^{NS} CG:0.34^{NS}			
Breastfed	24.1 (33/137)	23.8 (34/143)	21.6 (36/167)	22.0 (31/141)
Mean ± SD	2.6±1.43	2.6±1.18	2.6±1.23	2.5±1.25
Independent t-test	-0.14^{NS}		0.87^{NS}	
Independent t-test	IG:-0.32^{NS} CG:0.64^{NS}			
Breastfed				
6 to 11 mo.	13.3 (6/45)	19.0 (11/48)	10.1 (7/69)	14.1 (9/64)
Mean± SD	2.2±1.15	2.3±1.32	2.1±1.20	2.1±1.17
Independent t-test	-0.85^{NS}		0.02^{NS}	
Independent t-test	IG:0.05^{NS} CG:0.99^{NS}			
12 to 17 mo.	20.8 (10/48)	22.7 (10/44)	27.6 (16/58)	35.9 (14/39)
Mean± SD	2.5±1.35	2.9±0.90	2.9±1.22	3.0±1.22
Independent t-test	-1.28^{NS}		-0.38^{NS}	
Independent t-test	IG:-1.69^{NS} CG:-0.78^{NS}			
18 to 23 mo.	38.6 (17/44)	29.3 (12/41)	32.5 (13/40)	21.1 (8/38)
Mean± SD	3.2±1.60	2.8±1.13	3.2±1.00	2.7±1.23
Independent t-test	1.27 ^{NS}		1.84 ^{NS}	
Independent t-test	IG0.11^{NS} CG:0.28^{NS}			

*# Include those who's BF status not known; No significant change (corrected x^2 test used) in percent MMD score. * Significant at p<0.05*

With regard to the minimum meal frequency (MMF), overall MMF improved by 25.3% in IG ($p<0.05$) as compared to 8% in CG respectively (Table III-27).

Lastly, as presented in Table III-27, the key indicator minimum acceptable diet improved among IG breastfed children, whereas, among CG, there was a marginal decline.

Table III-27: Impact of Capacity Building on Minimum Meal Frequency and Minimum Acceptable Diet

Indicators	IG Pre	CG Pre	IG Post	CG Post
Minimum Meal Frequency				
Breastfed				
6 to 8 mo. – **>=2 times**	63.2 (12/19)	69.2 (18/26)	72.2 (26/36)	90.0 (27/30)
9 to 23 mo. – **>=3 times**	53.4 (62/116)	62.1 (72/116)	63.4 (83/131)	65.8 (73/111)
Non-breastfed				
6 to 23 mo. – **>=4 times**	22.2 (4/18)	38.1 (8/21)	46.2 (6/13)	36.7 (11/30)
Minimum Meal Frequency #	51.0 (78/153)	60.1 (98/163)	63.9 (115/180)	64.9 (111/171)
Minimum Acceptable Diet				
Breastfed				
6 to 8 mo. – **FG>=4 and >=2 time MMF**	0 (0/19)	15.4 (4/26)	2.8 (1/36)	10.0 (3/30)
9 to 23 mo. – **FG>=4 and >=3 times MMF**	19.0 (22/116)	19.8 (23/116)	19.8 (26/131)	18.0 (20/111)
Non-breastfed 6 to 23 mo. ##				
– **FG>=4 and >=2 FG** milk and >=4 times MMF**	5.5 (1/18)	0 (0/21)	0 (0/13)	0 (0/30)
Minimum Acceptable Diet	15.0 (23/153)	16.6 (27/163)	15.0 (27/180)	13.5 (23/171)

 # Statistically significant reduction in IG ($p<0.05$) and ## Statistically significant reduction in IG ($p<0.0001$)

Note: *FG= Food Group and MMF= Minimum Meal Frequency*

*** Due to non-availability of data on frequency of milk feed in place of 2 times milk feeding 2 milk food item were consider.*

No major significant impact of capacity building was noted on milk feeding frequency of non-breastfed children (6-23 mo.). The percentage of children consuming at least one milk food item reduced in IG from 66.7% (12/18) to 53.8% (7/13), whereas, among CG improvement was reported from 76.2% (16/21) to 80% (24/30).

Also, it is important to note that in IG, there was a reduction in number of children being non-breastfed in IG from 11.8 (18/153) to 7.2% (13/180), whereas, among CG there was an increase from 12.9% (21/163) to 17.5% (30/171) respectively. The change in both the groups was statistically non-significant.

- ***Type of Complementary Foods***

As presented in Table III-28, post capacity building, there was a significant improvement in breastfeeding status of child in IG (14.2%, p<0.01) as compared to CG where a reduction of 9.5% (85.1% to 77%) was reported.

Further, among the 7 food groups, IG showed improvement in 5 food groups as compared to, CG (4 food groups). When average score of all 7 groups was compared, IG showed improvement by 11.1% whereas, in CG there was a marginal reduction by 2% (Table III-28).

Table III-28 : Impact of Capacity Building on Type of Complementary Feed Consumed by Children (6-23 months)

Indicators	Pre		Post	
	IG % (N=178)	CG % (N=168)	IG % (N=190)	CG % (N=182)
Breastfeeding Status				
– Breastfed#	77.0 (137)	85.1 (143)	87.9 (167)	77.0 (141)
– Non-breastfed	10.1 (18)	12.5 (21)	6.8 (13)	16.4 (30)
– Don't know	12.9 (23)	2.4 (4)	5.3 (10)	6.6 (12)
Foods Groups Consumed 24 hours preceding the survey				
1. Grains, roots and tubers#	79.8 (142)	94.6 (159)	89.5 (170)	89.6 (163)
2. Legumes and nuts#	41.6 (74)	58.3 (98)	49.5 (94)	56.0 (102)
3. Dairy products (milk, yogurt, cheese)	38.8 (69)	41.7 (70)	43.7 (83)	45.6 (83)
4. Flesh foods (meat, fish, poultry and liver/organ meats)	0.6 (1)	1.2 (2)	0.0 (0)	2.2 (4)
5. Eggs	1.7 (3)	1.8 (3)	3.7 (7)	3.8 (7)
6. Vitamin-A rich fruits and vegetables	37.1 (66)	44.0 (74)	38.4 (73)	37.9 (69)
7. Other fruits and vegetables	27.5 (49)	20.2 (34)	27.4 (52)	21.4 (39)
Average	**32.4**	**37.4**	**36.0**	**36.6**

 # Statistically significant improvement in IG breastfeeding rates (p<0.01) and consumption of grains, roots and tubers (p<0.05); Among CG, consumption of legumes and nuts (p<0.05)

Among the breastfed children, the number of food groups consumed was higher in IG (grains, roots and tubers, legumes and nuts, dairy products and eggs) as compared to CG (dairy products and eggs). The average consumption improved by 4.7% (35.5% to 37.2%) in IG as compared to, a marginal decline in CG by 0.3% (36.5% to 36.4%) as presented in Table III-29.

Post capacity building, there was an improvement in use of all energy dense foods in IG, for top addition, as well as, for ghee in cooking. In CG top addition of oil decreased, whereas top addition for other energy dense food increased (Table III-30).

Table III-29: Impact of Capacity Building on Type of Complementary Feed Consumed by Breastfed and Non-breastfed Children

Foods Groups Consumed 24 hours preceding the survey	Pre		Post	
	IG %(N)	CG % (N)	IG %(N)	CG % (N)
Breastfed				
N=	**137**	**143**	**167**	**141**
1. Grains, roots and tubers	92.0 (126)	96.5 (138)	94.0 (157)	95.0 (134)
2. Legumes and nuts	46.0 (63)	57.3 (82)	50.3 (84)	54.6 (77)
3. Dairy products (milk, yogurt, cheese)	41.6 (57)	37.8 (54)	45.5 (76)	42.6 (60)
4. Flesh foods (meat, fish, poultry and liver/organ meats)	0.7 (1)	-	-	2.8 (4)
5. Eggs	2.2 (3)	1.4 (2)	4.2 (7)	4.3 (6)
6. Vitamin-A rich fruits and vegetables	40.9 (56)	41.3 (59)	39.5 (66)	37.6 (53)
7. Other fruits and vegetables	29.2 (40)	21.0 (30)	26.9 (45)	17.7 (25)
Average	**35.5**	**36.5**	**37.2**	**36.4**
Non-breastfed				
N=	**18**	**21**	**13**	**29**
1. Grains, roots and tubers	88.9 (16)	100.0 (21)	100.0 (13)	100.0 (29)
2. Legumes and nuts	61.1 (11)	76.2 (16)	76.9 (10)	86.2 (25)
3. Dairy products (milk, yogurt, cheese)	66.7 (12)	76.2 (16)	53.8 (7)	79.3 (23)
4. Flesh foods (meat, fish, poultry and liver/organ meats)	-	9.5 (2)	-	3.4 (1)
5. Eggs	-	4.8 (1)	-	3.4 (1)
6. Vitamin-a rich fruits and vegetables	55.6 (10)	71.4 (15)	53.8 (7)	55.2 (16)
7. Other fruits and vegetables	50.0 (9)	19.0 (4)	53.8 (7)	48.3 (14)
Average	**46.0**	**51.0**	**48.3**	**53.7**

Note: *Statistically non-significant change in IG and CG observed*

Table III-30: Impact of Capacity Building on Use of Energy Dense Complementary Foods (6-23 months)

Cooking and Top addition	IG % (N)		CG % (N)	
	Pre	Post	Pre	Post
At least one medium used#	43.9 (68/155)	51.1 (92/180)	32.9 (54/164)	47.1 (80/170)
Not yet started#	23	10	4	12
Oil	23.2 (36/155)	23.9 (43/180)	14.8 (24/162)	13.5 (23/170)
Ghee#	17.6 (27/153)	20.6 (37/180)	11.7 (19/162)	21.1 (36/171)
Sugar	9.7 (15/154)	11.7 (21/180)	9.3 (15/161)	12.4 (21/170)
Jaggery#	2.6 (4/155)	8.9 (16/180)	3.7 (6/163)	9.4 (16/171)

 # Statistically significant improvement in use of jaggery, ghee and use of at least one medium in CG ($p<0.05$) and IG reduction in not yet started ($p<0.01$)

The major source of iron-rich food, at baseline was fortified *Balbhog*, however, due to supply issue, at the time of post data collection; the supply of *Balbhog* was temporarily irregular. As a result, the overall consumption of iron-rich food reduced in both the groups (p<0.001), as well as, among the breastfed (IG p<0.001 and CG p<0.05) and non-breastfed children in each group (Table III-31). The only improvement noted was in the consumption of eggs, which improved in both the groups by 117.1% (IG) and 111.1% (CG) respectively.

Table III-31: Impact of Capacity Building on Consumption of Iron-Rich or Iron-Fortified Foods

6 to 23 mo.	Pre % (N)		Post % (N)	
	IG	CG	IG	CG
IFA supplement received#	10.2 (18/176)	3.6 (6/168)	27.5 (52/ 189)	29.8 (54/181)
Iron-rich foods #	30.9 (55/178)	41.7 (70/168)	11.1 (21/190)	24.6 (45/183)
– Fortified *Balbhog*	26.4 (47)	39.3 (66)	5.3 (10)	20.2 (37)
– GLV	3.4 (6)	-	2.1 (4)	-
– Egg	1.7 (3)	1.8 (3)	3.7 (7)	3.8 (7)
– Flesh foods (meat, fish, poultry and liver/organ meats)	0.6 (1)	1.2 (2)	0.0 (0)	2.2 (4)
Breastfed #	35.8 (49/137)	41.3 (59/143)	12.0 (20/167)	27.0 (38/141)
Non-breastfed	33.3 (6/18)	52.4 (11/21)	7.7 (1/13)	23.3 (7/30)

 # Statistically significant improvement in both groups regarding IFA consumption, reduction in overall consumption of iron-rich food, as well as, among breastfed children at p<0.001 except for CG breastfed p<0.05.

- ***Feeding During and After Illness***

The knowledge and perceptions of mothers of children below 2 years regarding feeding of childen recovering from illness improved significantly (p<0.001) in both the groups. Overall, 1.7 times (26.4% to 46.1%) more mothers in IG and 2.1 times (22.3% to 47.5%) more mothers in CG recommended increasing number of meals/quantity of food.

Breastfeeding during one of the most common illness diarrhea, improved in IG by 5.1% (76.1% to 80%) and declined in CG by 6.3% (91.9% to 86.1%). However, the differences were not statistically significant.

Overall, the improvement in appropriate response was better among IG pregnant women by 10.6% (31.7% vs. 21.1%) and IG lactating mothers' by 4.1% (21.8% vs. 17.8 %) as compared to CG respectively (Annexure 13 & Annexure 14).

Discussion Infant and Young Child Feeding Practices

Breastfeeding

In the current study, although the knowledge of pregnant and lactating mother's improved for both the groups, the impact of capacity building was mainly noted with reference to IG mother's knowledge regarding key breastfeeding practices like early breastfeeding practice, EBF and continued breastfeeding till 2 years and beyond.

The knowledge of pregnant women improved significantly for all 3 early breastfeeding practices, within IG; EIBF 35.7% (67.1 vs. 31.3%), colostrum feeding 21.3% (63.9% vs. 42.6%) and no prelacteal feeding 0.6 times(1.3 times vs. 0.7 times) as compared to changes within CG respectively.

Further, EBF improved in both groups among pregnant and lactating women, however, the improvement was more significant for IG lactating mothers ($p<0.001$) as compared to CG ($p<0.01$). Among pregnant women, significant improvement was only in CG ($p<0.01$).

Contrary to this, the knowledge regarding duration of breastfeeding with CF improved only among IG-pregnant women and CG lactating mothers.

Guldan *et al.* 2000 in a year-long community-based pilot nutrition education intervention (in congruent with 250 infants each in Education and Control groups) in China, including training and mobilizing of village nutrition educators (local women's affairs officials or village doctors, n=24 for 24 villages), who made monthly growth monitoring and CF counseling visits to all pregnant women and families with infants born during the intervention in the study villages, showed significantly higher nutrition knowledge and better reported infant feeding practices than control. Overall higher breastfeeding rates were noted in intervention group (83% vs. 75%; $p=0.034$) than control group infants.

In the current study, the transformation of improved knowledge of mothers into practice was better noted among IG mothers as compared to CG, as discussed in later sections. This transformation may be attributedto the quality of messages and support provided by IG AWWs during counseling.

In the current study, the counselling on breastfeeding during ANC ($p<0.001$), as well as, counselling by AWWs during pregnancy ($p<0.001$) and after child birth improved by 27.5%, 7.9 times and 2.4 times more in IG as compared to CG, respectively. As a result, in the current study, post capacity building, all four key indices on breastfeeding status improved better for IG as compared to, CG. The major improvement was in age appropriate feeding rate, which improved 1.4 times in IG as

compared to 1.1 times in CG.

The EIBF rates improved more among IG (65.4% to 88.7%) as compared to, CG (80.8% to 86.4%). No special impact of capacity building was noted in prelacteal feeding rates, which reduced in both the groups. The colostrum feeding rates improved by 3.9% more in IG (60.6% to 69.8%), as compared to, CG (58.6% to 65.3%). The mean number of breastfeeds per day, which is useful to assess the adequacy of breastfeeding, improved by 0.7 (9.9±3.7 to 10.6±4.7) feeds in IG as compared to only 0.1 (10.9±4.3 to 11±5.0) feeds in CG respectively.

Similar, to the current study, the Dular strategy designed to complement the government's ICDS with major goals to capitalize and develop community resources at the grassroots level, demonstrated differences in all major outcomes between Dular and non-Dular villages. An impact evaluation of 744 women and children in Jharkhand showed that women in Dular-intensive and Dular Regular villages were 4.6 and 4.0 times more likely; to feed colostrum than those in non-Dular villages (adjusted probabilities of colostrum delivery, 95.0%, 82.0%, and 20.7%, respectively). There was also a noticeable difference among Dular-intensive, Dular-regular, and non-Dular villages in the proportion of women breastfeeding their infants before giving them other foods or liquids (adjusted probabilities, 53.0%, 41.4%, and 17.1%, respectively). The study suggested far greater Dular outreach capacity with the use of neighborhood-based local resource persons (LRPs), focusing even on a relatively small number of behavioral change messages, capable of considerable impact at low cost (Dubowitz *et al.* 2007).

Early initiation and EBF in large-scale community-based programmes in Bolivia and Madagascar implemented with multiple local government, private voluntary organizations, and partners of non-governmental organizations (NGOs) through existing health and nutrition activities, showed statistically significant increase ($p<0.001$) in timely initiation of breastfeeding in both the countries i.e. Bolivia (56% in 2000 to 69% in 2001 to 74% by the end of 2003) and Madagascar (34% at baseline in 2000 to 69% in 2001, 76% in 2002, and 78% in 2004). EBF increased in Boliva from 81% (2000) to 88% (2003) and Madagascar (86% in 2000, to 91% by 2004. These results were achieved quickly and sustained over the course of the intervention (Baker *et al.* 2006).

In the current study the EBF rate (below 6 mo.) increased significantly ($p<0.001$) in IG by 2.6 times as compared to baseline, whereas, a marginal decline in EBF rates in CG was noted. Similarly, Bhandari *et al.* in 2003, in a cluster randomised controlled trial in the state of Haryana, showed that the training of health and nutrition workers

to counsel mothers for EBF at multiple opportunities, reported at 3 months, 79% (381/483) EBF in IG and 48% (197/412) in the CG (odds ratio 4.02, 95% CI 3.01–5.38, p<0.0001).

In the current study, the continued breastfeeding rate at 1 and 2 years improved in IG by around 12% (85.3% to 95.1% and 67.6% to 75.9%) respectively, whereas, in the CG, the rates declined by 11.3% (93.3% to 82.8%) at 1 year and 7.1% (67.6% to 62.8%) at 2 years respectively, however, the change was statistically non-significant for both groups. Similarly, Vitolo *et al.* (2005) assessed the impact of an intervention known as the Ten Steps to Healthy Feeding: A Nutritional Guide for Children under two on nutritional conditions and infant health in low-income families. Parents of the intervention group (200) received nutritional orientation during the child's first year of life. Both groups received visits at 6 and 12 months and routine follow-up by their pediatricians. The results (n=397) showed that the intervention was associated with a higher proportion of EBF at 4 months (RR=1.58; 95% CI: 1.21-2.06) and 6 months (RR=2.34; 95%CI: 1.37-3.99) and breastfeeding at 12 months (RR=1.26; 95%CI: 1.02-1.55). The results suggest that the nutritional orientation program led to positive changes in infant feeding practices.

Complementary Feeding

In the current study, the knowledge of mothers from both groups showed improvement, regarding three key aspects, i.e., the age of introduction of top milk, the age of introduction of complementary food (CF) and the age of introduction of food from family pot. The improvement in knowledge was statistically significant among IG regarding introduction of top milk (p<0.01) and introduction of food from family pot (p<0.05) and among CG, regarding age of introduction of CF (p<0.01) and introduction of food from family pot (p<0.01). There was a significant (p<0.01, t-value-2.612) shift in the knowledge regarding the mean age of introduction of top milk in IG from 9.56±9.18 to 6.57±4.90.

Similarly Daxini and Kanani 2009, in rural Vadodara, reported a significant (p<0.05) improvement, in knowledge among IG mothers regarding initiation of CF at 6 months (15% to 45%) as compared to CG (33% to 40%), after the intervention with NGO managed ICDS. Also, the study showed that more mother from IG (13% to 35%) reported that the child would become malnourished if there is delayed feeding beyond 6 months (p<0.05).

In the current study, the actual status of initiation of CF, post capacity building showed 6.4% and, 19.8% (p<0.05) more children (6-17 mo.) received top milk, and

solid food in IG as compared to CG. The introduction of solid food at 6 months and 6-8 months statistically increased in IG by 86.9% ($p<0.001$) and 32.8% ($p<0.05$) as compared to 3.1% and 13.6% reduction in CG.

The knowledge and perceptions of mothers (below 6 mo.) about consistency of CF improved in IG with more mothers recommending medium (53%) to thick (67.4%) consistency of CF, whereas, in CG, mothers' recommended thin liquid type CF increased by 1.4 times. The knowledge of mothers on optimal feeding frequency (one bowl 3 times a day) of children (7-11 mo.) improved in IG by 8% (123.7% vs. 115.7%) more as compared to CG; whereas, among older children (12-23 mo., 1½ bowl 5 times daily), the knowledge of CG mothers' improved significantly within CG by $p<0.05$.

In the current study, the actual quantity of CF per serving increased among breastfed children especially among children (6-8 mo.) not receiving any CF reduced significantly by almost 2.4 times ($p<0.05$) in IG, whereas, percentage of children not receiving any CF increased in CG. Also, a significant ($p<0.01$) increase in consumption of full bowl among children 18-23 months, was reported in IG (5 times) as compared to non-significant improvement in CG by 1.9 times respectively.

Among non-breastfed children (6-23 mo.) there was a remarkable increase in the quantity of CF in IG as compared to no such impact in CG. Most of the children in IG were given 1/3rd to full bowl per serving, whereas, at baseline most of the children in IG were given 1/4th to half bowl per serving.

The minimum dietary diversity (MDD) mean score improved in IG from 2.3±1.63 to 2.6±1.36, whereas, in CG the mean score reduced from 2.7±1.25 to 2.6±1.47. The minimum meal frequency (MMF) significantly improved in IG ($p<0.05$) by 25.3% as compared to non-significant improvement in CG (8%) respectively. Lastly, minimum acceptable diet improved among IG breastfed children, whereas, among CG, there was a marginal decline.

No major significant impact of capacity building was noted on milk feeding frequency of non-breastfed children (6-23 mo.) in IG (66.7% to 53.8%) and CG (76.2% to 80%). There was a significant ($p<0.01$) improvement in breastfeeding status of childen in IG by 14.2% as compared to, reduction in CG by 9.5%. Also, In IG, there was a reduction in number of children being non-breastfed (11.8% to 7.2%) as compared to an increase in CG (12.9% to 17.5%). Overall, the average consumption of 7 food groups improved in IG by 11.1%, whereas the consumption reduced in CG by 2% respectively. The improvement was statistical significant in IG regarding consumption of grains, roots and tubers ($p<0.05$) and CG regarding consumption of legumes and

nuts ($p<0.05$).

In the current study, post capacity building, there was an improvement in use of energy dense foods in IG, for top addition, as well as, for ghee in cooking. In CG, top addition of oil decreased, whereas top addition for other energy dense food increased, specially jaggery, ghee and use of at least any one energy dense medium, $p<0.05$.

Similarly, the study by Daxini and Kanani 2009, in rural Vadodara, reported a significant ($p<0.01$) higher proportion of IG mothers feeding fruits, vegetable, *rotla* and dal-rice and avoided giving biscuits compared to CG.

Kilaru *et al.* 2005 evaluated a nutrition education intervention, in Karnataka, using monthly nutrition education delivered by locally trained workers targeted at caregivers of infants (5-11 mo.), designed to improve infant growth and feeding practices. Post intervention, the intervention infants had a higher mean daily feeding frequency (more likely to be fed solids at least 4 times a day; OR = 4.35, 95% CI = 1.96, 10.00), higher dietary diversity (more likely to receive a more diverse diet; OR = 3.23, 95% CI = 1.28, 7.69), and were more likely to be fed foods suggested by the counsellors such as bananas (OR = 10.00, 95% = 2.78, 33.3) compared to non-intervention infants.

Bhandari *et al.* (2004) assessed the effectiveness of an educational intervention to promote adequate CF practices that would be feasible to sustain with existing resources showed that the 24-hours breastfeeding frequency at 9 mo was 6.6± 3.0 in CC and 7.8±3.0 in IC respectively ($p<0.01$); similarly the proportion of children breastfed at 9 months was 90.8% in CC and 94.7% in IC ($p<0.01$) respectively. Intakes of cereal legume gruels or mixes, milk cereal gruels or milk cereal mixes, and of undiluted milk were higher ($p<0.001$) in IC at 9 months. The meal frequencies ($p<0.001$) and energy intakes ($p<0.001$) were higher in the IC at 9 and 18 months, mainly due to increased intake of milk, other foods, and the addition of extra oil to the food in the IC.

A community-based, randomized controlled trial, similar to the current study, was conducted among 605 normal and mildly malnourished children 6 to 9 months in 121 Community Nutrition Centers (CNCs) of the Bangladesh Integrated Nutrition Project (BINP) in 4 regions (2000 to 2002). After the intervention (6 mo.), a significant increase in the frequency of CF was observed in IG, as compared with CG, and the increase was sustained throughout the observation period (6 mo.). The percent mothers giving CF, at least 3 time per day, increased by 83.8% in IG ($p<0.001$) as compared to 19.4% in CG. A much larger proportion of children in the IG were fed

khichuri as their main CF than children in CG (44.3% vs. 2.2%, p<0.0001). Even though this proportion decreased by the end of the observation period, it was still significantly higher in the IG than in CG. The proportion of mothers using extra oil to enhance energy density of CG doubled in IG (31.6% to 69.8%, p<0.01), whereas in CG, the proportion remained unchanged (Roy *et al.* 2007).

In the current study, the knowledge and perceptions of mothers of children below 2 years, improved significantly (p<0.001) in both the groups by 1.7 (IG) and 2.1 (CG) times, regarding feeding child with increasing number of meals/quantity of food while recovering from illness. Also, breastfeeding during diarrhea improved in IG by 5.1% and declined in CG by 6.3%, among those having diarrhea.

Post capacity building, significantly more mothers from IG (↑23.1%, 7.6 % and 7.6 times p<0.01) as compared to, CG (↓36.5% p<0.01, 3.6% and 1.7 times p<0.05), showed improved knowledge regarding responsive feeding behaviour such as, child can eat by him/herself around 2-3 years, it is important to sit and monitor the child while eating and mothers should encourage and feed the child, when the child refuses to complete the given food. Also, the knowledge of mothers (6-23 mo.) regarding washing hands with soap and water before CF, improved significantly in both groups by p<0.001.

Daxini and Kanani 2009, in rural Vadodara, reported that, post intervention the IG mothers learnt the importance of active feeding; feed the child at regular intervals (0% to 38%, p<0.001), encourage the child to finish up the meal (8% to 30%, p<0.01) and make child eat with the family members (38% to 50%). Roy *et al. (2007)* in a community-based, randomized controlled trial in Bangladesh showed higher proportion of mothers in IG than in CG used separate feeding pots for children (91.6% vs. 76.8%, p<0.001).

A study by Bhandari *et al.* 2004 assessed the effectiveness of an educational intervention to promote adequate CF practices that would be feasible to sustain with existing resources, and showed that at 9 months (34.8% vs. 7.7%; p<0.0001) and 18 months (89.7% vs. 49%; p<0.0001) mothers in IC reported actively encouraging their child to eat more as compared to CC. At this age, the practices that were reported more often in the IC than the CC included feeding with love and affection (41% vs.11%; p<0.0001), trying repeatedly if the child did not eat (15.4% vs. 1%; p<0.0001), mother feeding the child herself (34.9 vs. 26.4%; p<0.0001), making the child sit in the mother's lap (18.2% vs. 6.6%, p<0.0001), and feeding the child with other family members (12.4% vs. 2.5%; p<0.0001). There was no interaction between gender and intervention effect on any of the responsive feeding behaviors. The proportion of mothers who reported washing their hands before feeding the child (94.5 vs. 59.9%; p<0.0001) and their child's hands before feeding (87.8% vs. 42.4%; p<=0.0001) was higher in the IC at 18 months.

Recently, Shi and Zhange (2011) studied effectiveness of educational intervention programs, from 1998 onwards on improving CF practices in the developing world. Evidence from 15 studies, supported that educational intervention can effectively improve CF practices and child nutrition and growth. They also concluded that intervention should be culturally sensitive, accessible and integrated with local resources.

Caulfied *et al.* (1999) evaluated programmatic efforts to improve dietary intake and growth in 6 to 12 months infants in developing countries, the results of 5 efficacy trials and 16 programmes conducted in 14 countries, were reviewed. Efficacy trials were able to improve infant dietary intakes by 65 to 302 kcal per day. Programmes reported large improvements in maternal knowledge and practices concerning infant feeding, four programmes that provided information reported improvements in dietary intakes of 71 to 164 kcal/day *et al.*

In a study by Bhandari *et al.* 2004, discused earlier, higher proportion of caretakers spontaneously recalled being counseled on optimal CF practices 34% vs. 0.2% (p<0.0001) at the immunization sessions, 43% vs. 0.5% (p<0.0001) at home visits, and 36% vs. 0% (p<0.0001) at the weighing sessions, in IC and control communities (CC), respectively. The trends for exposure to different channels and the counseling received at age 18 mo were similar to those at 9 months and also did not vary by child's sex.

Other studies have shown a similar effect of educational interventions, by health and nutrition system on infant feeding practices, as discused further.

The Linkage project (2002,2006) implemented an integrated nutrition package at large scale (6 districts, 1.4 million population) in Madagascar using the Essential Nutrition Actions (ENA) framework, through the maximization of contacts using multiple program opportunities within existing health systems and community structures and through mass media. Trained community based volunteers of Women's Groups (n=4300 women representing 259 different groups in 2 provinces) were utilized to disseminate messages related to breastfeeding and child nutrition. The volunteers were successful in reinforcing nutrition messages locally. The cross sectional household survey revealed significant ($p<0.001$) increase in EIBF within 1 hour of birth (32-68%), EBF below 6 months (42-70%), continuation of breastfeeding at 20-23 months (43-73%), and the rate of feeding children the minimum recommended number of meals per day at 6-23 months (87-93%). Modest improvement in feeding of the sick child after illness was noted, whereas, no improvements were reported in increasing food intake during child illness or pregnancy. Positive behaviors changes were seen among mothers regarding infant feeding practices; reduction in the percentage of mothers giving their infants CF prior to 6 months, increase dietary diversity in terms of higher consumption of recommended foods like fish, fruits, vegetables and oils/fats ($p<0.01$). However, the results were inconclusive regarding food diversity for CF. Feeding frequency remained low. Significantly more children (84% vs. 78%) washed their hands before eating (Guyoun 2009).

It is generally believed that interventions to improve child rearing and feeding practices must begin soon after birth of the child. Bolam *et al.* (1998) in a randomized controlled trial, in Nepal, with community follow up at 3 and 6 months post partum, showed no significant differences between groups with regard to infant feeding, infant care, or immunization. In the study 3 female health educators, 2 midwives, and 1 community health worker were trained to give the health education. The study recommended that the practice of individual health education for postnatal mothers in poor communities has no impact on infant feeding, care, or immunization, although uptake of family planning may be slightly enhanced.

Between 1989 and 1995, in a community-based program to improve women's and children's nutritional status in Mali, interpersonal and group counseling by field workers was used to reach women and village mobilization meetings, role plays and radio to reach men. In project villages the proportion of mothers giving children colostrum more than doubled (from 25% to 58%), while the proportion of those not giving water to infants (0-4 mo.) increased from 10% to 21%. The proportion of

mothers in project villages feeding porridge (6-8 mo.) grew from 33% to 53%; fruit (6-8 mo.) from 12% to 27%; and meat/liver (6-10 mo.) from 18% to 35% (Gottert 1995).

In a community randomized, controlled effectiveness trial in India (rural Haryana), the health and nutrition workers in the intervention community were trained to counsel mothers at multiple contacts on EBF and on appropriate CF practices thereafter. The intervention also included community and health worker mobilization. An increase in the number of channels through which caregivers were counseled was positively associated with EBF prevalence at 3 months ($p=0.002$), consumption of milk/cereal gruel or mix use at 9 months ($p=0.004$) and 18 months ($p=0.003$), undiluted milk at 9 months ($p<0.0001$) and 24 hour non-breast-milk energy intakes at 18 months ($p=0.023$), after controlling for potential confounding factors (Bhandari *et al.* 2005).

Further, in a longitudinal community-based study (1997-2001) of infant growth, feeding and care practices in rural south India, monthly visit for nutrition counselling was made by a trained worker. The intervention community as a whole had improved feeding practices such as avoidance of feeding bottle and increased variety of foods. The implication of this association, in a culture where discrimination against females exists, is promising for the development of low-cost educational interventions to improve nutritional status without the need to provide supplementary food (Ghosh *et al.* 2002).

Lastly, the literature review identified only one study conducted in 1997, showing results contrary to the above studies. The WFP and CARE, 1997 project in Rajasthan, showed limited results. The “Nutrition and Health Education (NHED) project trained ICDS functionaries (582 AWWs and 27 Supervisors) to improve the knowledge and skills on the nutrition and health related content. The outcome of the project interventions was significant in some of the areas i.e. food and its functions, treatments of disease, immunization. However, it showed a poor increase in the knowledge related to breastfeeding, diet, nutrition and health promotion and growth monitoring. Nevertheless, the NHED project recommended that such training should be continuous and ongoing and should include innovative ways of training the AWWs (CARE 1997).

C. Utilization of Integrated Child Development Services for Children under two Years

1. Growth Monitoring and Promotion

Post capacity building, more mothers in IG 17.5% (74.6% to 87.6%, $p<0.001$) as

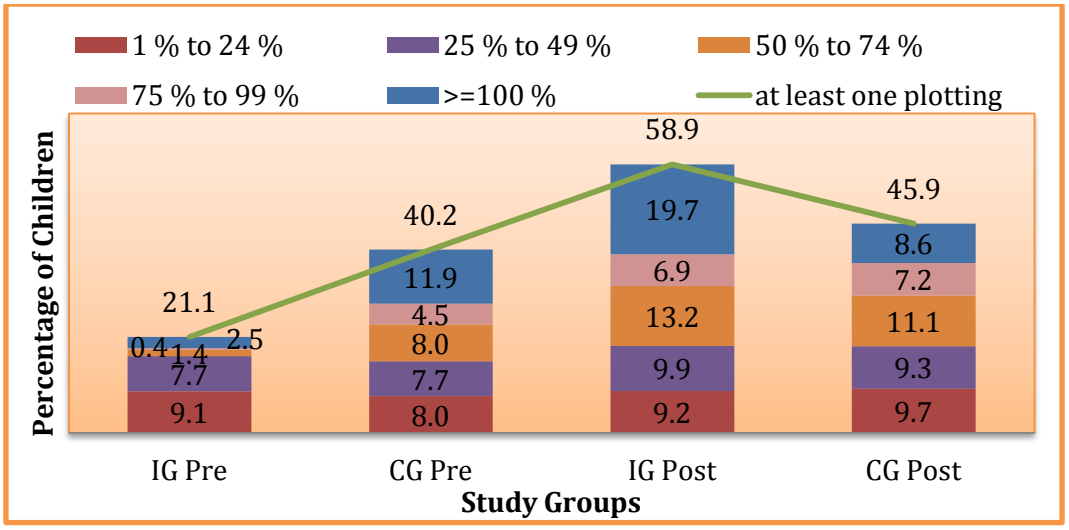
compared to, CG 14.8% (79.7% to 91.5%, p<0.001) perceived weighing children regularly, as important. However, the knowledge about frequency of GMP improved marginally in IG (monthly; 48.2% to 50.4%) as compared to CG (monthly; 48.7% to 62.3%, p<0.01). Also post intervention, almost the same number of mothers in IG and CG could state benefits of GMP. The key benefit listed by IG (40.3%) and CG (48.1%) were to know whether the child has gained or lost weight. The other benefits listed by IG and CG were, to detect growth faltering on growth chart (0.9% and 1.4%), to know whether child is healthy/is in green and/or not (8.0% and 10.4%), to know the nutritional status of child (0% and 2.8%) and to know child's weight (19.9% and 10.8%).

With reference to actual GMP on field, there was a 20.9% (67.7% to 81.9%, p<0.01) increase in IG, among children weighed in last 30 days as compared to, CG 5.2% (69.2% to 72.8%). Also, recent plotting on *MAMTA* card after GMP improved in IG by 4.3 times (8.4% to 36.5%, p<0.001), whereas, in CG recent plotting reduced by 1/3rd (24.8% to 18.3%). Overall, there was a reduction in percentage of children with no plotting on *MAMTA* card in IG (36.1%, 103/285 to 8.2%, 25/304, p<0.001) as compared to CG (14.7%, 42/286 to 12.9%, 36/279).

More, importantly, the plotting on *MAMTA* card by AWWs improved in IG 5.3 times (6.7%, 19/285 to 35.5%, 108/304, p<0.001) as compared to, only 3.3 times (3.5%, 10/286 to 11.5%, 32/279) in CG.

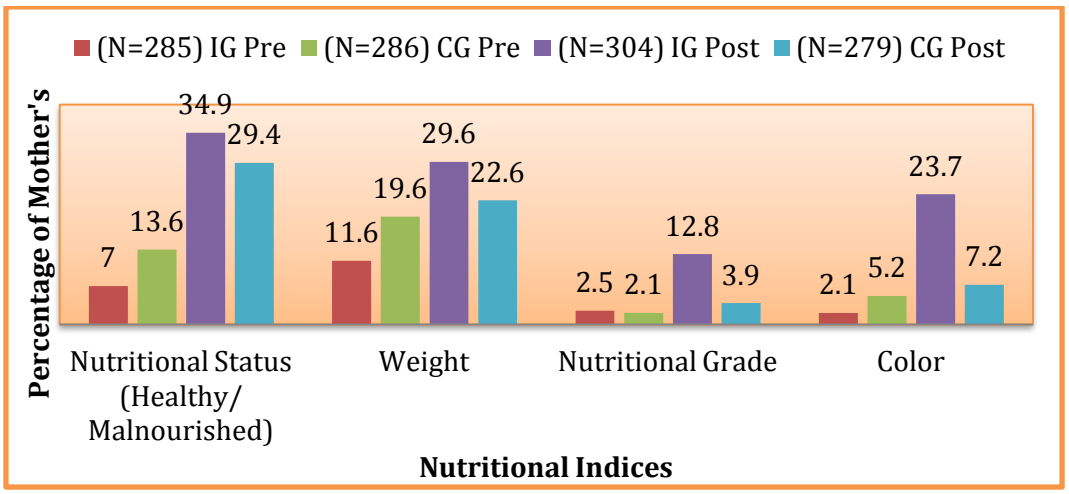
Also, as presented in Figure III-19, there was an increase in percentage of children with >=100% plotting on *MAMTA* card, from 2.5% to 19.7%, in IG (p<0.05), whereas, there was a marginal reduction, in CG (11.9% to 8.6%).

Figure III-19: Impact of Capacity Building on status of *MAMTA* card plotting during Growth Monitoring and Promotion



Post capacity building, the mothers' awareness regarding index child's nutritional status improved significantly (p<0.001) in IG for all 4 indices as compared to significant improvement related to only one indices in CG (Figure III-20).

Figure III-20: Impact of Capacity Building on Mother's Awareness on the Index Child's Nutritional Status



***Note**: Statistically significant improvement in IG (all 4 indices) and CG (Nutrition Status), p<0.001*

During baseline, it was observed, that 23.2% children (66/285) in IG, and 27.6% (79/286) in CG were weighted when they came for immunization. However, post intervention; there was a non-significant increase in the percentage of children weighed other than immunization/health checkup by 5.5% (69.8%, 199/285 to 73.7%, 194/304) in IG and reduction in CG by 5.9% (67.8%, 194/286 to 63.8%, 178/279). However, when compared between the two post groups (IG 73.7% vs. CG 63.8%), the difference was statistically significant p<0.001. No such difference was noted in GMP with immunization.

2. Village Health and Nutrition Day (*MAMTA DAY*)

Post capacity building, the awareness among mothers' about *MAMTA DAY* celebration and its schedule increased among IG mother's, by 69% and 55% more as compared to, CG (Table III-32). Most importantly the participation of mothers' on the *MAMTA DAY* (preceding the survey) improved in IG by 17.7% as compared to a marginal reduction in CG by 1.2%.

Table III-32: *MAMTA DAY* - Awareness and Service Utilization Pre and Post Intervention

***MAMTA DAY* - Awareness and Service Utilization**	**Pre % (N)**		**Post % (N)**	
	IG N= 285	**CG N=286**	**IG N=304**	**CG N=279**
Heard about *MAMTA DAY*	10.5 (30)	15.7 (45)	25.7 (78)	27.6 (77)
Attending *MAMTA DAY*#	98.6 (283)	95.8 (274)	97.4 (296)	89.6 (249)
Aware of *MAMTA DAY* Schedule				
Correct	12.5 (36)	15.4 (44)	24.7(75)	21.9 (61)
Partially correct	22 (63)	23.4 (67)	28.6 (87)	21.9 (61)
Attended *MAMTA DAY* (preceding survey)	48.1 (138)	51 (146)	56.6 (172)	50.4 (140)

 # Statistically significant reduction in CG (p<0.01) mother's attending MAMTA DAY

c) *Awareness and Utilization of MAMTA Card*

Post capacity building, as presented in Table III-33, there was an approximate 7 times significant increase in counseling using *MAMTA* card, as well as, key IYCF and GMP messages using *MAMTA* card by IG-AWWs (p<0.001); whereas, among the CG-AWWs the improvement was only 1.2 times the baseline.

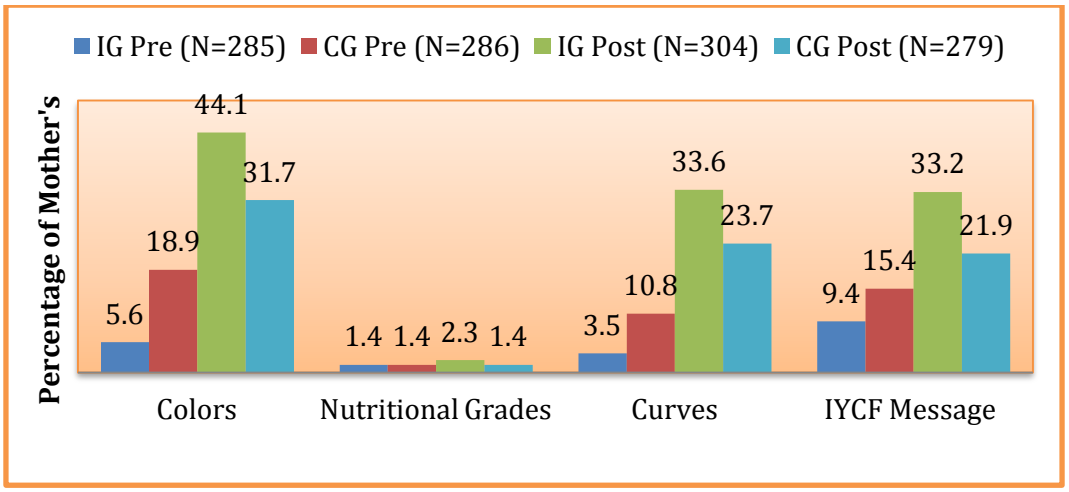
Table III-33: Impact of Capacity Building on Sources of Counseling on *MAMTA* Card Key Messages

Indicators	**Pre % (N)**		**Post % (N)**	
	IG N=287	**CG N=285**	**IG N=304**	**CG N=278**
Sources of counselling using *MAMTA* card				
Anganwadi worker#	5.9 (17)	12.6 (36)	42.4 (129)	14.7 (41)
ANM/FHW	12.2 (35)	27.0 (77)	13.8 (42)	20.1 (56)
ICDS Supervisor	-	-	1.0 (3)	2.2 (6)
MPHW/ASHA/village volunteers	1.4 (4)	1.4 (4)	5.6 (17)	1.8 (5)
Counseling on card key messages by *Anganwadi* workers using MATMA card				
Total#	**5.6 (16)**	**12.6 (36)**	**42.4 (129)**	**14.7 (41)**
No prelacteals	-	0.4 (1)	-	-
EIBF	3.8 (11)	0.4 (1)	-	-
Breastfeeding	0.3 (1)	-	3.9 (12)	-
Exclusive breastfeeding	0.3 (1)	0.4 (1)	3.0 (9)	-
IYCF messages	-	3.5 (10)	28.0 (85)	8.6 (24)
Birth weight	5.9 (17)	3.2 (9)	0.7 (2)	0.7 (2)
Growth chart, grade color	-	0.7 (2)	29.9 (91)	11.9 (33)
Growth chart, nutritional grade	-	-	1.0 (3)	-
Growth chart, change in weight/grade	-	0.4 (1)	3.6 (11)	-
Growth chart, curve	-	-	-	0.4 (1)
Balbhog; SNP	-	-	0.7 (2)	

#Multiple responses possible, statistically significant improvement in IG (p<0.001)

Post capacity building, the mothers' referring to IYCF guidelines on *MAMTA* card improved significantly (p<0.01) in both the groups by around 1.5 times. Further, mothers' understanding of growth chart and IYCF guidelines on *MAMTA* card also improved, by 7.6 and 3.5 times in IG (p<0.001) as compared to, 1.8 (p<0.001) and 1.4 times in CG respectively (Figure III-21).

Figure III-21: Impact of Capacity Building on Mother's Understanding of IYCF Guidelines and Growth Chart on *MAMTA* Card



***Note**: Statistically significant (p<0.001) improvement in IG - mothers' understanding of IYCF guidelines and growth chart colour and curves of IG and CG-mothers'*

3. Awareness and Utilization of *Balbhog* Supplementation

During the capacity building, the IG-AWWs were especially explained importance of *Balbhog* supplementatoin and its possible impact on undernutrition reduction and prevention. Further, empahsis was laid on distribution of *Balbhog* after GMP counselling, followup of use of *Balbhog* during home visits, as well as, key messages on *Balbhog* which needs to be given to the caregivers while giving *Balbhog*.

Post capacity building, due to supply issues related to *Balbhog*, the children (6-23 mo.) receiving Supplementary Food (SF) (including *Balbhog*) reduced significantly in both the groups; IG by 13.3% (83.7%, 149/178 to 72.6%, 138/190; p<0.05) and CG by 20.9% (85.8%, 145/169 to 67.9%, 125/184; p<0.001) respectively. Overall, the supply of *Balbhog* reduced significantly (p<0.001) in both the groups by around 22-23%; IG 81.5% 145 to 63.7% 121 and CG 85.8%, 145 to 66.3%, 122 respectively. Also, as a result of reduced supply of *Balbhog*, there was a 7-5 times significant increase in distribution of cooked snacks at the AWCs; IG 6.7% (12) to 44.7% (85) p<0.001 and CG 1.2% (2) to 6.5% (12) p<0.05 respectively.

a) *Status of Balbhog Supplementation by Anganwadi Centers*

Post capacity building, the frequency of receiving *Balbhog* continued to remain once/twice a month in both the groups; 54.2% IG and 49.4% CG. And, majority of the beneficiaries continued to receive 2-3 packets at a time, pre and post capacity building.

The major impact of capacity building was seen regarding the timing of distribution of *Balbhog*; with 4.6 time more IG-children (6-23 mo.) (4.5%, 8/178 to 21.1%, 40/190; p<0.001) as compared to, 1.2 times CG-children (1.8%, 3/169 to 2.2%, 4/184) receiving *Balbhog* on *MAMTA DAY*.

b) *Household Utilization of Balbhog*

Due to reduction in supply of *Balbhog*, no major conclusion could be drawn regarding the daily and weekly utilization of *Balbhog* in two groups. As presented in Figure III-22, the daily frequency of *Balbhog* consumption continued to remain 1-3 times a day, with a marginal rise in mean daily frequency in both the groups (Figure III-23).

Also, the weekly frequency of consumption of *Balbhog* continued to remain 7 days a week (Figure III-24), with a 12.3% increase in IG (50.4% to 56.6%) and 29.5% reduction in CG (73.1% to 51.6%). As a result, the mean weekly frequency improved in IG, whereas reduced in CG (Figure III-25)

Figure III-22: Daily Frequency of Consumption of *Balbhog* - Pre and Post Capacity Building

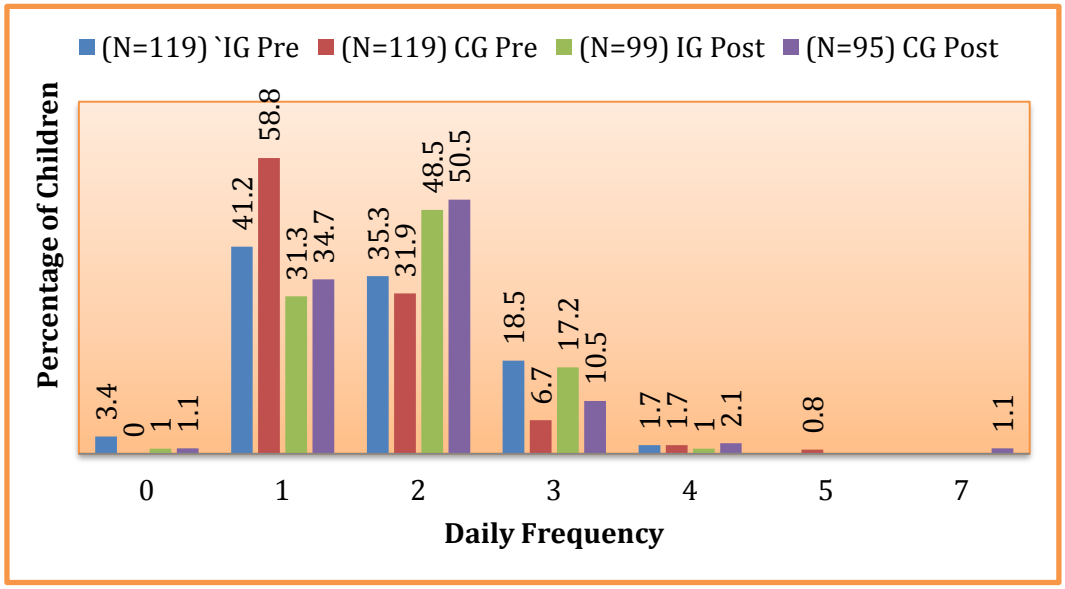


Figure III-23: Mean Daily Frequency of Consumption of *Balbhog* Pre and Post Capacity Building

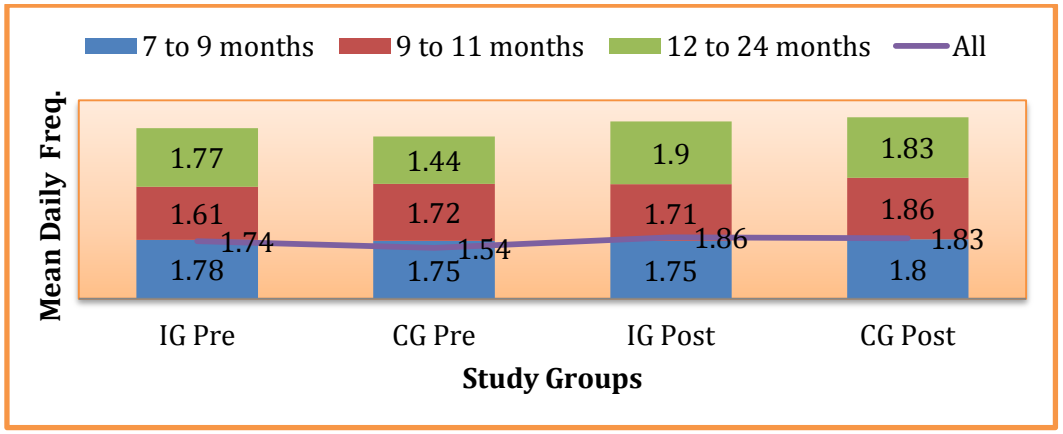


Figure III-24: Weekly Frequency of Consumption of *Balbhog* - Pre and Post Capacity Building

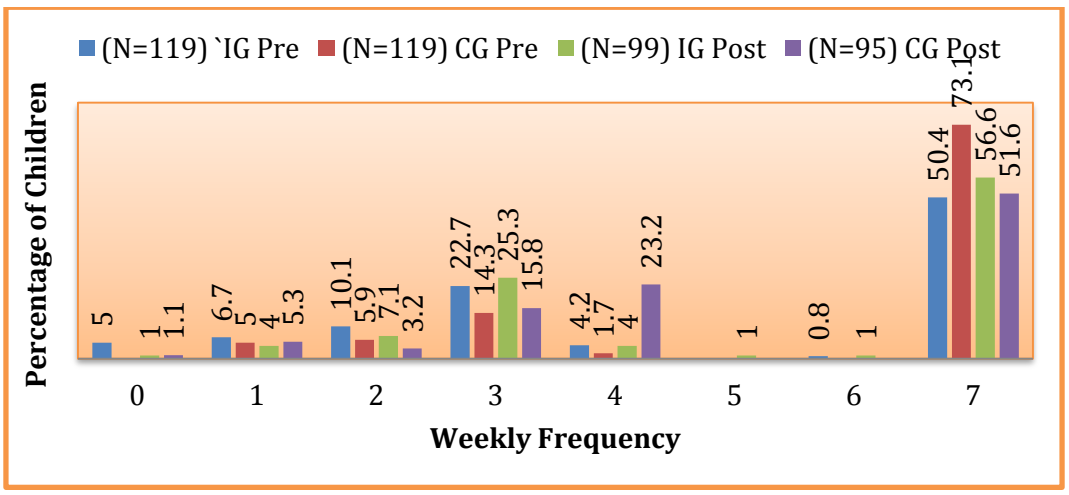
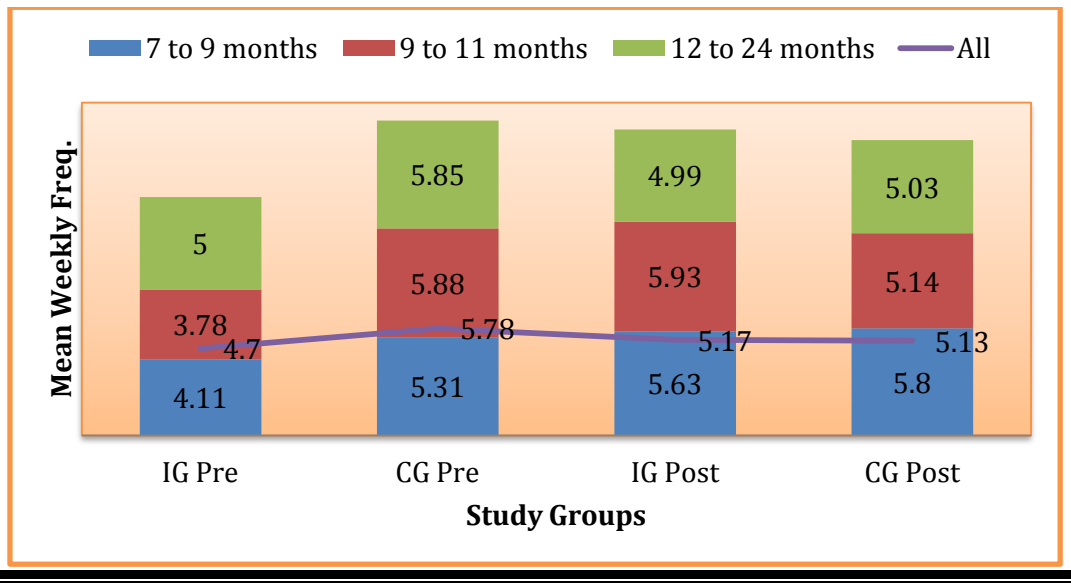


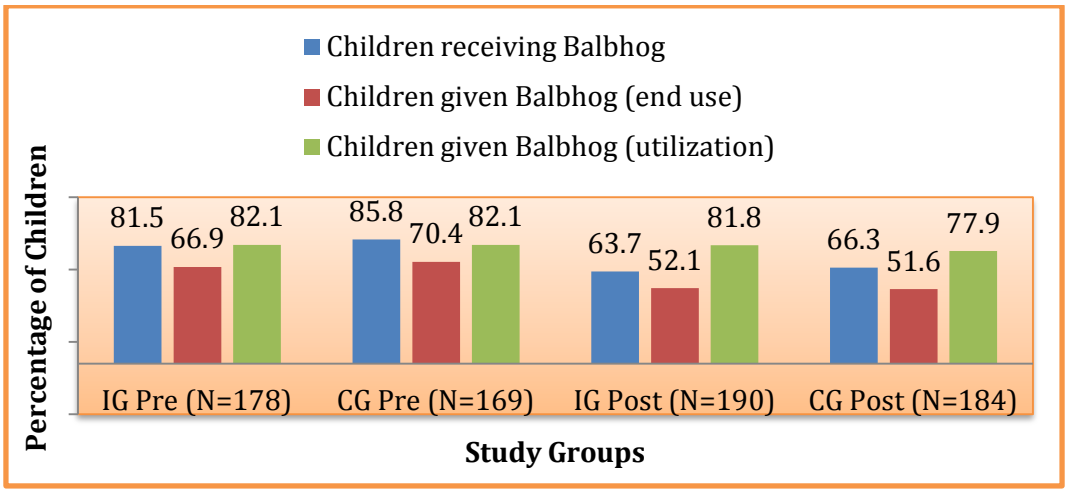
Figure III-25: Mean Weekly Frequency of Consumption of *Balbhog* - Pre and Post Capacity Building



There was no major change in the type and number of recipes from *Balbhog*, prepared by caregivers, pre and post capacity building, between the two groups.

Although there was a significant (p<0.001) reduction in supply of *Balbhog*, in both the groups, due to supply issue, however, post capacity building, the reduction in IG was less as compared to, CG by 4.6% (end use) and 4.8% (utilization), which may be as a result of increase utilization and end use of *Balbhog* in the IG children 6-23 months (Figure III-26).

Figure III-26: Status of Utilization of *Balbhog* at Household



Note: *End-use calculated among all children; Utilization calculated among those who received Balbhog. Statistically significant reduction in supply (p<0.001) and end-use (p<0.01) of Balbhog in both groups*

Lastly, the mothers' perceiving *Balbhog* as beneficial for the child, among those who were giving *Balbhog*, improved significantly in IG by 26.8% (61.3% to 77.8%; p<0.05) and CG by 28.6% (63.9% to 82.1%; p<0.01) respectively. Most of the mothers' (around 27%) in both groups continue perceiving weight and health improvement as key benefits of *Balbhog*.

Discussion: Utilization of Integrated Child Development Services for Children under two Years

Growth Monitoring and Promotion

In the current study, post capacity building, there was a significant (p<0.001) improvement in mothers in both the groups, who perceived weighing children regularly as important (IG ↑17.5% and CG ↑14.8%).

However, post capacity building significant improvement in GMP activity were only noted in IG, in activities such as weighing in most recent 30 days (↑21%, p<0.01),

plotting on *MAMTA* card after GMP (↑4.3 times, p<0.001), nil plotting (↓77.3%, p<0.001), overall plotting on *MAMTA* card (↑5.3 times, p<0.001), >=100% plotting on *MAMTA* card (7.9 time, p<0.05), mothers awareness of child's nutritional status, weight, nutritional grade and colour (p<0.001,↑5, ↑2.6, ↑5.1 and ↑11.3 times) as compared to, non-significant changes in CG, except about mother's awareness of child's nutritional status (p<0.001, ↑2.2 times)

As a result, there was a noticeable increase in growth monitoring of children other than those attending the immunization/health checkup, in the IG (5.5%) as compared to reduction in CG by 5.9%. Also, the difference between the two groups post intervention (73.7%vs.63.8%) was statistically significant p<0.001.

Village Health and Nutrition Day (*MAMTA DAY*)

In the current study, post capacity building, awareness of *MAMTA DAY* schedule increased in IG by 55% more (97.6% vs. 42.2%) as compared to CG. Most importantly the participation of mothers' on the *MAMTA DAY* (preceding the survey) improved by 17.7% in IG as compared to reduction in CG by 1.2%.

The overall counseling by AWWs using MAMTA card, as well as counseling by AWWs on key IYCF and GMP messages using *MAMTA* card improved significantly (p<0.001) in IG by around 7 to 7.5 times; whereas, among the CG-AWWs the improvement was only 1.2 times.

Post capacity building, the mothers' refereeing to IYCF guidelines on *MAMTA* card improved significantly (p<0.01) in both the groups by around 1.5 times. Also, post capacity building there was a Statistically significant (p<0.001) improvement in IG - mothers' understanding of IYCF guidelines, as well as, growth chart colour and curves of both IG and CG-mothers' respectively.

Awareness and Utilization of *Balbhog* Supplementation

In the current study, post capacity building, there was a significant reduction in supply of Supplementary Food including *Balbhog* (p<0.05 and p<0.01), *Balbhog* (p<0.001) and supply of cooked snacks (p<0.001 and p<0.05) in IG and CG, by around 13-21%, 22-23% and 7-5 times, respectively.

The major impact of capacity building was regarding distribution of *Balbhog* on *MAMTA DAY*, which increased significantly (p<0.001) among IG children (6-23 mo.) by 4.6 times as compared to, only 1.2 times increase in CG.

Due to reduction in supply of *Balbhog*, no major conclusion could be drawn regarding the frequency and mean household utilization of *Balbhog*, however, in spite of supply

issue, the statistically significant reduction in end use and utilization of *Balbhog* among children (6-23 mo.), was lesser in IG, by 4.6% and 4.8% as compared to, CG, which may be the impact of capacity building. The perceived benefits of *Balbhog* for children also improved significantly in IG (26.8%, $p<0.05$) and CG (28.6%, $p<0.01$) respectively.

Effectiveness of Educational Intervention on ICDS Service Utilization

Thus, in the current study, the major impact of capacity building was observed in the quality of implementation of ICDS services including, participation on *MAMTA DAY and* GMP; use of MAMTA card, growth chart for tracking child growth, counselling on child's nutritional status and follow-ups; use of standardized IYCF guidelines for counselling and reference by AWWs and beneficiaries; end use of *Balbhog*. All this could be the key reasons behind successful behaviour change related to IYCF and GMP, and observed impact on nutritional status of children under two years of age.

The results of various studies conducted globally and locally to study the effect of educational interventions on service utilization were review.

Contrary to the current study findings, Daxini and Kanani (2009) in a study in rural Vadodara concluded that even though, there was a very significant improvement in the knowledge of AWWs regarding child feeding and care practices; there was not much improvement in the quality of GM, SF, *rab* supplementation and NHE services. Their communication and counseling skills also did not show any substantial improvement.

This difference in results between the current study and study by Daxini and Kanani may be as a result of difference in the capacity building process adopted in the two studies. In the current study, the strongest component of capacity building training was ensuring how each message was effectively communicated, with adequate rational behind following the recommended optimal IYCF practices and GMP, leading to behavour change.

Further, the study by Daxini and Kanani (2009) discovered that contrary to interview, during the spot observations, the quality of implementation of service at field level showed little improvement. Only a few AWWs used the growth chart as an NHE tool to counsel mothers regarding growth and development of their child. None of them plotted the weight immediately on the growth chart after the weight measurement. Standard cups were used for serving the cooked snacks only in half of the AWCs and no standard measurements were used for measuring the raw ingredients. Majority of the children ate a little quantity of SF and took the rest home. Rab was not prepared

once during the observation period after the intervention. The AWWs did not continue to regularly conduct NHE meetings nor did they improve the quality of the home visits. At many AWCs, the AWWs were either on leave, busy with immunization, filling records and registers or involved in other activities like school admission – all of which adversely affected the quality of implementation of all other ICDS services. Monitoring and supervision remain weak even after the intervention. Monitoring was random and not goal oriented.

Bhandari *et al.* (2005), in a study in Rural Haryana showed that in IG, about 32% of caregivers were counseled by traditional birth attendants at birth. The most frequent sources of counselling from birth to 3 months were immunization sessions (45.1%) and home visits (32.1%), followed closely by weighing sessions (25.5%); from 7 to 12 months, home visits (42.6%) became more important than the other two. The study concluded that using multiple available opportunities and workers for counselling caregivers was feasible, resulted in high coverage and impact.

Similarly, Bhandari *et al.* (2004) in an educational intervention to promote appropriate complementary feeding practices and physical growth in infants and young children in rural Haryana showed that during the 9 month visit, a higher proportion of infants in the IG vs. CG had one or more of the following contacts in the last 3 months; home visit by AWWs (67% vs. 31%; $p<0.001$), attendance at weighing sessions (47% vs. 1%; $p<0.001$), immunization sessions (77% vs. 85%).

A large number of monitoring studies indicate that the ICDS program has many problems with implementation, as well as program design. One major implementation problem is that AWWs are inadequately trained, supervised and supported, which is unfortunate since their duties require considerable understanding of nutrition, pre-school education, maternal and child health issues and hence constant supervision (Lokshin *et al.* 2005).

Similarly Guldan *et al.* (2000) showed that at the end of the intervention in China, 60% of the mothers said that they were visited once per month by the nutrition educator, the study thus concluded that effective training emphasizing counseling techniques and incentives for village level nutrition educators as well as strong supervision of their work are crucial to the improvement of infant feeding in the village households; in particular how to effectively reach mothers and enable them to understand and adapt the new behaviours.

Also, Kanani and Zararia (1996), in a social assessment of ICDS in Gujarat concluded that effective goal oriented monitoring aided by a rational management information system (MIS) can make a significant contribution to the management and

impact of a program. Further, more frequent the monitoring more is the time and effort devoted to a program in the community.

D. Nutritional Status of Children Under Two years

a) *Profile of children covered*

Post intervention, a total of 929/1210 children (U-2 yrs) listed by AWW were assessed for anthropometric measurements as compared to a total 943/1229 children listed by AWW at baseline. Of the children listed by AWW, on an average, 23% children, pre and post intervention, were not available for anthropometric measurement. Of these, 52.6% children belonged to the IG, and 47.4% to CG (Table III-34). Between the two groups, the ratio of male to female was comparable, further, sex-wise also there was no significant difference between the children covered. Among the three age groups, 50% children belonged to 12-23 months, 23% children belonged to 0-5 months and 26% were in-between 6-11 months of age. Also, age groups wise difference between IG and CG was statistically non-significant.

Table III-34: Profile of Children Covered

	IG		CG		Total	
	Pre (a)	Post (b)	Pre (c)	Post (d)	Pre (a+c)	Post (b+d)
N (%)	468 (49.6)	489 (52.6)	475 (50.4)	440 (47.4)	943	929
Sex						
– **Female**	213 (45.5)	248 (50.7)	220 (46.3)	219 (49.8)	433 (45.9)	467 (50.3)
– **Male**	255 (54.5)	241 (49.3)	255 (53.7)	221 (50.2)	510 (54.1)	462 (49.7)
$\chi 2$					0.06	0.08
Age Group (months)						
– **0-5 mo.**[11]	130 (27.8)	119 (24.3)	119 (25.1)	97 (22)	249 (26.4)	216 (23.3)
– **6-11 mo.**	120 (25.6)	130 (26.6)	129 (27.2)	114 (25.9)	249 (26.4)	244 (26.3)
– **12-23 mo.**	218 (46.6)	240 (49.1)	227 (47.8)	229 (52)	445 (47.2)	469 (50.5)
$\chi 2$					0.94	0.97

[11] Age groups are described in intervals of months completed. For example, infants 0–5 months of age have completed 5 months but are less than 6 months (or 183 days) old.

b) *Change in Prevalence of Undernutrition*

Post capacity building, although there was a decline in overall nutritional status of children (U-2 yrs) in both the groups, the decline was statistically significant, for all indicators in CG except for stunting, whereas the decline in prevalence was statistically significant only for underweight, among IG (Table III-35). This finding shows a positive impact of capacity building, in limited span, on the nutritional status of IG children (U-2 yrs).

The (Table III-35) shows the pre and post prevalence of undernutrition (underweight, stunting, wasting and SAM) and the respective mean z-scores for children below 2 years. Further,Table III-36 presents, the risk ratio and risk difference estimate of undernutrition post capacity building, within IG and CG.

Post capacity building, the underweight (WAZ<-2SD) children in CG increased significantly ($p<0.01$) by 23% as compared to only 13.2% in IG (Table III-35).

To analyze the mean z-score, the t value was calculated using independent t test. The Independent t test was used since, the pre and post measurements were obtained from the cross sectional survey of children (U-2 yrs) during the survey. Although the mean value (WAZ) reduced in both the groups, the reduction in mean value was highly significant ($p<0.001$) in CG as compared to IG ($p<0.05$) (Table III-35).

With regard to wasting (WHZ<-2SD), the prevalence of wasting, significantly ($p<0.05$), increased by 17% more in CG (24.7%) as compared to IG (7.7%). The mean WHZ z-score reduced significantly ($p<0.001$) in CG by 0.27 z-score more (-0.33 vs. -0.06) as compared to IG.

Post capacity building, increase in severe undernutrition (underweight, stunting and wasting) was greater in CG as compared to IG. Specially, the prevalence of severe stunting (HAZ<3SD), reduced in IG by 6.5%, whereas in CG severe stunting increased by 9.7% (Table III-35).

A major impact of capacity building was noted on the prevalence of SAM (MUACZ<-3SD). Contrary to a 2.2 times increase in SAM among CG, post capacity building, children with SAM reduced in IG by 1.6 times (Table III-35). Overall, children with MUACZ<-2SD reduced by 10.1% in IG, as contrast to a 56.4% increase in CG. Also, the mean MUACZ score increased significantly ($p<0.05$) in IG by 0.2 z-score, as against a significant ($p<0.01$) reduction of 0.36 z-score in CG.

On assessing, the RR estimates it was observed that the IG had 9%, 3% and 13% less risk of developing underweight, stunting and wasting as compared to CG (Table III-36). Also, a protective effect of capacity building on the prevalence of SAM was

observed in IG with RR<1, as against a 41% risk of developing SAM among CG. Further, post capacity building, the risk difference analysis also showed that IG had 3.4%, 0.89% (2.11 vs. 3), 4.51% and 3.71% less underweight, stunted, and wasted and SAM children as compared to CG (Table III-36).

The difference in mean WAZ and MUAC z-score within the IG showed significant correlation. Whereas, in the CG, significant correlations were observed between the mean WAZ, WHZ and MUACZ score (Annexure 12) pre and post intervention.

Table III-35: Change in Level of Undernutrition among Children 0-23 months after Intervention

Total	Intervention (IG)		Control (CG)	
	Pre	Post	Pre	Post
% Weight-For-Age (WAZ Score)				
N	462	489	475	439
Normal	47.6 (220)	40.7 (199)	54.7 (260)	44.4 (195)
% < -2SD	52.4 (242)	59.3 (290)	45.2 (215)	55.6 (244)
$\chi 2$	4.34*		9.31**	
% < -3SD	21.4 (99)	24.7 (121)	16.6 (79)	22.8 (100)
Mean ± SD	-2.03±1.22	-2.22±1.16	-1.90±1.15	-2.15±1.16
T values	2.37*		3.30**	
% Length/height-for-age (HAZ Score)				
N	450	488	473	437
Normal	64.0 (288)	61.9 (302)	63.6 (301)	60.6 (265)
% < -2SD	36.0 (162)	38.1(186)	36.4 (172)	39.4 (172)
$\chi 2$	0.36		0.74	
% < -3SD	15.3 (69)	14.3 (70)	14.4 (68)	15.8 (69)
Mean ± SD	-1.53±1.46	-1.66±1.23	-1.62±1.27	-1.69±1.31
T values	1.46		0.77	
% Weight-for-length/height (WHZ Score)				
N	454	482	475	435
Normal	58.4(265)	55.2 (266)	68.8 (327)	61.1 (266)
% < -2SD	41.6 (189)	44.8 (216)	31.2 (148)	38.9 (169)
$\chi 2$	0.84		5.59*	
% < -3SD	15 (68)	16 (77)	8.6 (41)	12.2 (53)
Mean ± SD	-1.74±1.16	-1.80±1.19	-1.36±1.21	-1.69±1.09
T values	0.8		4.25***	
% Mid-upper arm circumference-for-age - 6 to 23 months (MUACZ score)				
N	335	367	354	341
Normal	78.2 (262)	80.4(295)	87.6 (310)	80.6 (275)
% < -2SD	21.8 (73)	19.6 (72)	12.4 (44)	19.4 (66)
$\chi 2$	0.38		5.74*	
% < -3SD (SAM)	4.2 (14)	2.7 (10)	2 (7)	4.4 (15)
Mean ± SD	-1.22±1.06	-1.02±1.03	-0.91±1.02	-1.27±0.94
T values	2.44*		4.79***	

** Significant at p<0.05* *** Significant at p<0.01* **** Significant at p<0.001*

***Note**: Children over nourished were excluded from analysis. Total in each category may differ due to missing values. <-2SD include <-3SD*

Table III-36: Risk Ratio and Risk Difference Estimates of Undernutrition after Capacity Building– Intervention vs. Control Group

Total	Groups	N	Risk Ratio (RR)			Risk Difference (RD)		
			Value	95% CI		Value	95% CI	
				Lower	Upper		Lower	Upper
WAZ	IG	951	1.15	1.01	1.30	6.92	0.62	13.22
<-2 SD	CG	914	1.24	1.08	1.42	10.32	3.86	16.78
HAZ	IG	938	1.04	0.92	1.18	2.11	-4.07	8.30
<-2 SD	CG	910	1.07	0.93	1.23	3.00	-3.31	9.30
WHZ	IG	936	1.06	0.94	1.21	3.18	-3.16	9.53
<-2SD	CG	910	1.19	1.04	1.36	7.69	1.50	12.88
MUACZ	IG	702	0.79	0.49	1.28	-1.29	-3.93	1.36
<-3SD	CG	695	1.41	1.05	1.89	2.42	-0.19	5.03

Sex-wise Impact of Capacity Building

As presented in Table III-37, the change in levels of undernutrition among males was similar in both groups.

Among CG males, the increase in prevalence of undernutrition and reduction in respective z-score was statistically significant for all indicators except for stunting, whereas among IG males the change was statistically non-significant for all indicators (Table III-37).

The major impact of capacity building was on the prevalence of SAM (MUACZ<-3SD) and severe stunting (HAZ<-3SD). The prevalence of severe stunting (HAZ<3SD) reduced by 10.5% among IG males, Among CG males severe stunting increased by 18.2%. Post capacity building, contrary to a 4.1 times increase in SAM among CG, the children with SAM reduced in IG by 1.3 times (Table III-37). Overall, the MUACZ<-2SD increased non-significantly in IG (0.87%), in contrast to a statistically significantly ($p<0.05$) increase in CG (64.06%) males. Similarly, the mean MUACZ score increased non-significantly among IG males by 0.15 z-score, as against a significant ($p<0.05$) reduction of 0.40 z-score in CG males.

On assessing, the RR estimates it was observed that as compared to CG males, the IG males had 17%, 7% and 18% less risk of developing underweight, stunting and wasting. A protective effect of capacity building on the prevalence of SAM (MUACZ <-3SD) was observed in IG with RR<1, as against a 63% risk of developing SAM among CG males (Table III-38).

Further, the risk difference analysis also showed that IG males had 6.56%, 6.67%, 6.42% and 5.57% less underweight, stunting, and wasting and SAM among children as compared to CG males, which can be attributed to the capacity building.

Table III-37: Change in Level of Undernutrition among Male Children 0-23 months after Intervention

Male	IG		CG	
	Pre (a)	Post (b)	Pre (c)	Post (d)
% Weight-For-Age (WAZ Score)				
N	**253**	**241**	**255**	**221**
Normal	42.3 (107)	38.2 (92)	54.1 (138)	43.4 (96)
% < -2SD	57.7 (146)	61.8 (149)	45.9 (117)	56.6 (125)
$\chi 2$	0.71		4.98*	
% < -3SD	21.3 (54)	30.3 (73)	16.9 (43)	24.9 (55)
Mean ± SD	-2.14±1.18	-2.32±1.18	-1.95±1.09	-2.20±1.19
T values	1.67		2.46*	
% Length/height-for-age (HAZ Score)				
N	**250**	**240**	**253**	**219**
Normal	60.8 (152)	58.8 (141)	58.5 (148)	53.9 (118)
% < -2SD	39.2 (98)	41.3 (99)	41.5 (105)	46.1 (101)
$\chi 2$	0.137		0.838	
% < -3SD	17.2 (43)	15.4 (37)	17 (43)	20.1 (44)
Mean ± SD	-1.63±1.49	-1.75±1.25	-1.74±1.28	-1.84±1.35
T values	0.96		0.88	
% Weight-for-length/height (WHZ Score)				
N	**249**	**236**	**255**	**219**
Normal	56.6 (141)	53.4 (126)	69 (176)	59.4 (130
% < -2SD	43.4 (108)	46.6 (110)	31.0 (79)	40.6 (89)
$\chi 2$	0.39		4.39*	
% < -3SD	14.9 (37)	18.6 (44)	6.7 (17)	13.2 (29)
Mean ± SD	-1.81 ± 1.14	-1.90±1.18	-1.37±1.16	-1.74±1.10
T values	0.91		3.50**	
% Mid-upper arm circumference-for-age - 6 to 23 months (MUACZ score)				
N	**187**	**181**	**188**	**176**
Normal	77.0 (144)	76.8 (139)	87.2 (164)	79.0 (139)
% < -2SD	23.0 (43)	23.2 (42)	12.8(24)	21.0 (37)
$\chi 2$	0.00		3.87*	
% < -3SD	5.3 (10)	3.9 (7)	1.6 (3)	5.7 (10)
Mean ± SD	-1.26±1.01	-1.11±1.08	-0.95±0.96	-1.35±0.95
T values	1.38		4.02***	

** Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001*

***Note**: Children over nourished were excluded from analysis. Total in each category may differ due to missing values. <-2SD include <-3SD*

Table III-38: Risk Ratio and Risk Difference Estimates of Undernutrition after Capacity Building among Males – Intervention vs. Control Group

Male	Groups	N	Risk Ratio (RR)			Risk Difference (RD)		
			Value	95% CI		Value	95% CI	
				Lower	Upper		Lower	Upper
WAZ	IG	494	1.09	0.91	1.32	4.12	-4.52	12.76
<-2 SD	CG	476	1.26	1.04	1.53	10.68	1.73	19.63
HAZ	IG	490	1.04	0.87	1.25	-2.05	-10.73	6.63
<-2 SD	CG	472	1.11	0.91	1.34	4.62	-4.35	13.59
WHZ	IG	485	1.07	0.89	1.28	3.24	-5.62	12.09
<-2SD	CG	474	1.25	1.03	1.51	9.66	1.03	18.29
MUACZ	IG	368	0.83	0.47	1.48	-1.48	-5.76	2.90
<-3SD	CG	364	1.63	1.18	2.23	4.09	0.23	7.95

The Table III-39 and Table III-40 present, the impact of capacity building on prevalence of undernutrition, mean z-score, and the RR and RD estimates among IG and CG females.

Among females, the prevalence of underweight increased significantly among CG and IG females, whereas the prevalence of severe underweight refereed as WAZ<-3SD, reduced among the IG females by 9.8% as compared to, an increase in prevalence of severe underweight among CG females by 25.6% (Table III-39).

A positive impact of the capacity building was seen in reduced prevalence of SAM among IG females. Contrary to an, increase in SAM (i.e. WHZ<-3SD and MUAC<-3SD) by 1.8% and 25% in CG females, the prevalence of severe wasting reduced by 11.2% and 40.7% in IG females.

Not only SAM, but the females with MUAC<-2SD was also reduced by 20.7% among IG, as against increase by 46.7% among CG, and, the mean MUAC z-score of CG was reduced (-0.31) significantly by $p<0.001$ as compared to increase in IG by 0.22 MUAC z-score.

As presented in Table III-40, the RR estimates showed a protective effect of capacity building on SAM (MUAC<-3SD) among IG females (RR=0.83), as against an increase risk in stunting and SAM by 6% and 35% among CG females.

The risk difference estimate showed 2.09% and 1.71% less prevalence of wasting and SAM (MUAC<-3SD) among IG female as compared to CG female, which may be a result of improved feeding practices resulting in improved nutrition, post capacity building (Table III-40).

Table III- 39: Change in Level of Undernutrition among Female Children 0-23 months after Intervention

Female	IG		CG	
	Pre (a)	Post (b)	Pre (c)	Post (d)
% Weight-For-Age (WAZ Score)				
N	**209**	**248**	**220**	**218**
Normal	54.1 (113)	43.1 (107)	55.5 (122)	45.4 (99)
% < -2SD	45.9 (96)	56.9 (141)	44.5(98)	54.6(119)
$\chi 2$	4.99*		4.02*	
% < -3SD	21.5 (45)	19.4 (48)	16.4 (36)	20.6 (45)
Mean ± SD	-1.90±1.26	-2.12±1.12	-1.83±1.21	-2.09±1.12
T values	1.92		2.28	
% Length/height-for-age (HAZ Score)				
N	**200**	**248**	**220**	**218**
Normal	68.0 (136)	64.9 (161)	69.5 (153)	67.4 (147)
% < -2SD	32.0 64)	35.1(87)	30.5(67)	32.6 (71)
$\chi 2$	0.34		0.14	
% < -3SD	13 (26)	13.3 (33)	11.4 (25)	11.5 (25)
Mean ± SD	-1.41±1.41	-1.57±1.20	-1.49±1.25	-1.53±1.25
T values	1.35		0.34	
% Weight-for-length/height (WHZ Score)				
N	**205**	**246**	**220**	**216**
Normal	60.5 (124)	56.9 (140)	68.6 (151)	63 (136)
% < -2SD	39.5 (81)	43.1 (106)	31.4 (69)	37 (80)
$\chi 2$	0.45		1.32	
% < -3SD	15.1 (31)	13.4 (33)	10.9 (24)	11.1 (24)
Mean ± SD	-1.67±1.18	-1.71±1.18	-1.35±1.26	-1.63±1.07
T values	0.39		2.54*	
% Mid-upper arm circumference-for-age – 6-23 months (MUACZ score)				
N	**148**	**186**	**166**	**165**
Normal	79.7 (118)	83.9 (156)	88.0 (146)	83.4 (136)
% < -2SD	20.3 (30)	16.1 (30)	12.0 (20)	17.6 (29)
$\chi 2$	0.70		1.59	
% < -3SD	2.7 (4)	1.6 (3)	2.4 (4)	3.0 (5)
Mean ± SD	-1.16±1.12	-0.94± 0.97	-0.87±1.09	-1.18±0.92
T values	1.92		2.79**	

** Significant at p<0.05* *** Significant at p<0.01* **** Significant at p<0.001*

***Note**: Children over nourished were excluded from analysis. Total in each category may differ due to missing values. <-2SD include <-3SD*

Table III-40: Risk Ratio and Risk Difference Estimates of Undernutrition after Capacity Building among Females – Intervention vs. Control Group

Female	Group	N	Risk Ratio (RR)			Risk Difference (RD)		
			Value	95% CI		Value	95% CI	
				Lower	Upper		Lower	Upper
WAZ <-2 SD	IG	457	1.22	1.03	1.45	10.92	1.78	20.01
	CG	438	1.22	1.01	1.48	10.04	0.72	19.36
HAZ <-2 SD	IG	448	1.06	0.89	1.26	3.08	-5.70	11.86
	CG	438	1.05	0.86	1.28	2.11	-6.59	10.81
WHZ <-2SD	IG	451	1.07	0.90	1.27	3.58	-5.54	12.69
	CG	436	1.13	0.93	1.37	5.67	-3.22	14.57
MUACZ <-3SD	IG	334	0.77	0.32	1.81	-1.09	-4.27	2.09
	CG	331	1.12	0.62	2.03	0.62	-2.88	4.13

Table III-41: Age Group Wise Risk Ratio and Risk Difference Estimates of Undernutrition after Capacity - Intervention vs. Control Group

Indicators	Group	Risk Estimate			Risk Difference		
		Value	95% CI		Value	95% CI	
			Lower	Upper		Lower	Upper
0 to 5 months							
WAZ <-2SD	**IG**	1.47	1.13	1.90	18.45	6.20	30.71
	CG	1.17	0.87	1.58	6.98	-6.08	20.03
HAZ <-2SD	**IG**	1.31	0.99	1.73	8.64	-1.16	18.38
	CG	1.06	0.74	1.51	1.77	-9.30	12.83
WHZ <-2SD	**IG**	0.99	0.76	1.29	-0.44	-12.90	12.02
	CG	1.16	0.85	1.59	5.53	-6.70	17.76
6 to 11 months							
WAZ <-2SD	**IG**	1.11	0.87	1.41	5.32	-6.96	17.60
	CG	1.23	0.93	1.61	9.53	-3.01	22.07
HAZ <-2SD	**IG**	1.01	0.77	1.31	0.32	-10.91	11.55
	CG	0.90	0.68	1.20	-4.36	-16.44	7.73
WHZ <-2SD	**IG**	1.14	0.89	1.45	6.32	-5.69	18.33
	CG	1.38	1.06	1.79	14.20	2.28	26.12
MUACZ<-3SD	**IG**	1.29	0.57	2.89	0.71	-2.00	3.45
	CG	1.69	1.16	2.47	4.58	-0.33	9.48
12 to 23 months							
WAZ <-2SD	**IG**	1.01	0.84	1.22	0.43	-8.15	9.00
	CG	1.26	1.04	1.53	11.18	2.11	20.25
HAZ <-2SD	**IG**	0.97	0.81	1.15	-1.80	-11.02	7.41
	CG	1.12	0.93	1.34	5.54	-3.61	14.69
WHZ <-2SD	**IG**	1.06	0.89	1.26	3.10	-6.13	12.33
	CG	1.10	0.91	1.33	4.58	-4.35	13.52
MUACZ<-3SD	**IG**	0.72	0.41	1.25	-2.64	-6.54	1.25
	CG	1.24	0.80	1.92	1.31	-1.76	4.38

Age-wise Impact of Capacity Building

As presented in the (Table III-42), the prevalence of underweight (WAZ<-2SD) among children 0-5 months, increased significantly in IG ($p<0.01$), as against a lower

increase among the CG. As a result the mean WAZ score also reduced significantly (p<0.001) among IG (Table III-42). Contrary to this, the prevalence of wasting (WHZ<-2SD) and SAM (WHZ<-3SD) reduced in IG by 0.85% and 9.9% respectively, whereas, the prevalence increased in CG by 7.5% (WHZ<-2SD) and 50% (WHZ<-3SD) respectively. The assessment of the RR estimates showed a 30% and 25% greater risk of underweight and stunting among IG children (0-5 mo.) as compared to CG. The RR estimates showed a protective effect of capacity building on wasting in the IG (RR<0) as compared to a 16% increase risk of wasting among CG.

The risk difference analysis in Table III-41, concluded that post capacity building, the IG had 5.97% less prevalence of wasting as compared to CG, whereas, no impact of capacity building on undernutrition and stunting was observed within the IG

Table III-42: Post Intervention Change in Undernutrition among Children 0-5 months

0 to 5 mo.	Intervention (IG)		Control (CG)	
	Pre (a)	Post (b)	Pre (c)	Post (d)
% Weight-For-Age (WAZ Score)				
N	**127**	**119**	**119**	**97**
Normal	63.0 (80)	44.5 (53)	64.7 (77)	57.7 (56)
% < -2SD	37(47)	55.5(66)	35.3(42)	42.3(41)
$\chi 2$	7.70**		0.82	
% < -3SD	15 (19)	21 (25)	10.1 (12)	20.6 (20)
Mean ± SD	-1.56±1.25	-2.11 ±1.11	-1.62±1.11	-1.85±1.27
T values	3. 62***		1.40	
% Length/height-for-age (HAZ Score)				
N	**121**	**119**	**118**	**95**
Normal	86.0 (104)	77.3 (92)	79.7 (94)	77.9 (74)
% < -2SD	14.0 (17)	22.7(27)	20.3 (24)	22.1(21)
$\chi 2$	2.44		0.02	
% < -3SD	4.1 (5)	8.4 (10)	8.5 (10)	9.5 (9)
Mean ± SD	-0.71±1.32	-1.23±1.21	-1.14±1.26	-1.13±1.26
T values	3.21		0.03	
% Weight-for-length/height (WHZ Score)				
N	**123**	**117**	**119**	**95**
Normal	58.5 (72)	59.0 (69)	73.9 (88)	68.4 (65)
% < -2SD	41.5 (51)	41.0 (48)	26.1(31)	31.6(30)
$\chi 2$	0.00		0.54	
% < -3SD	17.1 (21)	15.4 (18)	8.4 (10)	12.6 (12)
Mean ± SD	-1.71±1.23	-1.64±1.27	-1.11±1.29	-1.43±1.24
T values	0.39		1.80	

** Significant at p<0.05* *** Significant at p<0.01* **** Significant at p<0.001*

***Note**: Children over nourished were excluded from analysis. Total in each category may differ due to missing values. <-2SD include <-3SD*

The 6-11 months age is a very critical period, where undernutrition sets in, due to inappropriate breastfeeding and CF practices.

Post capacity building, the mean WAZ, WHZ and MUACZ score among children 6-11 months, reduced significantly in CG; as compared to non-significant decline in IG (Table III-43).

With reference to severe undernutrition, the prevalence of severe stunting reduced 3.3 times more among IG (37.2%) as compared to CG (11.4%) (Table III-43). The prevalence of MUAC<-2SD reduced within IG, by 18.3% as contrast to a significant ($p<0.05$) increase in CG by almost 2.4 times. Also, the prevalence of SAM (MUACZ <-3SD), increased by 3.8 times more among CG as compared to 2 times increase among IG.

On assessing the RR estimates, it was observed that IG had 12%, 24% and 43% less risk of underweight, wasting and SAM (MUACZ<-3SD) as compared to CG, this impact may be a result of improved feeding practices, seen among the IG.

It can be concluded, from the risk difference analysis (Table III-41), that IG had 4.21%, 7.88% and 3.87% less underweight, wasting and SAM (MUACZ<-3SD), post capacity building as compared to CG children (6-11 mo.). However, the risk difference and RR estimates also showed a 4.68% and 1% higher incidence and risk of stunting among IG as compared to CG children 6-11 months.

Table III-43: Post Intervention Change in Undernutrition among Children 6-11 months

6 to 11 months	Intervention		Control	
	Pre (a)	Post (b)	Pre (c)	Post (d)
% Weight-For-Age (WAZ Score)				
N	**120**	**130**	**129**	**114**
Normal	59.2 (71)	53.8 (70)	54.3 (70)	44.7 (51)
% < -2SD	40.8 (49)	46.2 (60)	45.7 (59)	55.3 (63)
$\chi 2$	0.52		1.83	
% < -3SD	15.8 (19)	18.5 (24)	14.7 (19)	19.3 (22)
Mean ± SD	-1.86±1.13	-1.97±1.16	-1.83±1.20	-2.16±1.23
T values	0.78		2.13*	
% Length/height-for-age (HAZ Score)				
N	**116**	**129**	**129**	**113**
Normal	72.4 (84)	72.1 (93)	62.0 (80)	66.4 (75)
% < -2SD	27.6 (32)	27.9 (36)	38.0 (49)	33.6 (38)
$\chi 2$	0.00		0.33	
% < -3SD	8.6 (10)	5.4 (7)	14 (18)	12.4 (14)
Mean ± SD	-1.29±1.23	-1.36±1.08	-1.65±1.19	-1.49±1.27
T values	0.49		1.03	

6 to 11 months	Intervention		Control	
	Pre (a)	Post (b)	Pre (c)	Post (d)
% Weight-for-length/height (WHZ Score)				
N	**118**	**127**	**129**	**114**
Normal	66.9 (79)	60.6 (77)	72.1 (93)	57.9 (66)
% < -2SD	33.1(39)	39.4(50)	27.9(36)	42.1(48)
$\chi 2$	0.80		4.78*	
% < -3SD	7.6 (9)	17.3 (22)	7.0 (9)	14.0 (16)
Mean ± SD	-1.51±1.08	-1.67±1.20	-1.19±1.26	-1.78 ±1.10
T values	1.10		3.90***	
% Mid-upper arm circumference-for-age (MUACZ score)				
N	**118**	**128**	**128**	**114**
Normal	84.7 (100)	87.5 (112)	92.2 (118)	81.6 (93)
% < -2SD	15.3 (18)	12.5 (16)	7.8 (10)	18.4 (21)
$\chi 2$	0.19		5.16*	
% < -3SD	0.8 (1)	1.6 (2)	1.6 (2)	6.1 (7)
Mean ± SD	-0.90±0.97	-0.83±1.05	-0.76±1.03	-1.19±0.97
T values	0.51		3.90***	

** Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001*

***Note**: Children over-nourished were excluded from analysis. Total in each category may differ due to missing values. <-2SD include <-3SD*

The impact of capacity building was assessed on the prevalence of underweight, stunting and SAM among children 12-23 months. Underweight, stunting, MUACZ<-2SD and SAM (WHZ<-3SD, MUACZ<-3SD) reduced among IG by 0.6%, 3.4%, 7.5%, 12.9% and 1.8 times, as contrary to an increase by 22.4% ($p<0.05$) and 12.6%, 32%, 14.4% and 1.75 times among CG (Table III-44). Also, the mean MUACZ values significantly increased in IG by 0.27 ($p<0.01$), whereas the z-score reduced significantly ($p<0.001$) by 0.31 z-score in CG.

Further, the RR estimates, as presented in Table III-41 showed a protective effect of capacity building on IG, contrary to an increase risk of stunting 12% and SAM (MUAC<-3SD) 24% among CG, post capacity building. The risk estimates showed a 25% and 4% higher risk of underweight and wasting among CG as compared to IG (12-23 mo.), post capacity building.

Thus, the risk difference analysis showed, that IG had 10.75%, 7.34%, 1.48% and 3.95% less underweight, stunting, wasting and SAM (MUACZ<-3SD), post capacity building as compared to CG children 12-23 months.

Table III-44: Post Intervention Change in Undernutrition among Children 12-23 months

12 to 23 months	Intervention (IG)		Control (CG)	
	Pre (a)	Post (b)	Pre (c)	Post (d)
% Weight-For-Age (WAZ Score)				
N	215	240	227	**228**
Normal	32.1 (69)	31.7 (76)	49.8 (113)	38.6 (88)
% < -2SD	67.9 (146)	68.3 (164)	50.2 (114)	61.4 (140)
$\chi 2$	0.00		5.32*	
% < -3SD	28.4 (61)	30.0 (72)	21.1 (48)	25.4 (58)
Mean ± SD	-2.41±1.14	-2.40 ±1.15	-2.08 ±1.11	-2.27±1.04
T values	0.07		1.88	
% Length/height-for-age (HAZ Score)				
N	**213**	**240**	**226**	**229**
Normal	46.9 (100)	48.8 (117)	56.2 (127)	50.7 (116)
% < -2SD	53.1(113)	51.3(123)	43.8(99)	49.3(113)
$\chi 2$	0.08		1.19	
% < -3SD	25.4 (54)	29.2 (70)	17.7 (40)	20.1 (46)
Mean ± SD	-2.13±1.39	-2.03±1.20	-1.86±1.26	-2.02± 1.25
T values	0.82		1.34	
% Weight-for-length/height (WHZ Score)				
N	**213**	**238**	**227**	**226**
Normal	53.5 (114)	50.4 (120)	64.3 (146)	59.7 (135)
% < -2SD	46.5 (99)	49.6 (118)	35.7 (81)	40.3 (91)
$\chi 2$	0.32		0.83	
% < -3SD	17.8 (38)	15.5 (37)	9.7 (22)	11.1 (25)
Mean ± SD	-1.89±1.14	-1.96±1.12	-1.60±1.09	-1.75±1.00
T values	0.58		1.60	
% Mid-upper arm circumference-for-age (MUACZ score)				
N	**217**	**239**	**226**	**227**
Normal	74.7 (162)	76.6 (183)	85.0 (192)	80.2 (182)
% < -2SD	25.3 (55)	23.4 (56)	15.0 (34)	19.8(45)
$\chi 2$	0.13		1.48	
% < -3SD	6 (13)	3.3 (8)	2.2 (5)	3.5 (8)
Mean ± SD	-1.39±1.07	-1.12±1.02	-1.00±1.01	-1.31± 0.92
T values	2.69**		3.37***	

** Significant at p<0.05* *** Significant at p<0.01* **** Significant at p<0.001*

***Note**: Children over nourished were excluded from analysis. Total in each category may differ due to missing values. <-2SD include <-3SD*

Cluster-wise Impact of Capacity Building

A cluster-wise variation was noted regarding the background characteristics (such as education, age, and trainings) of *Anganwadi* workers (AWWs), within the IG and CG. As a result, it was obvious, that the impact of capacity building would be different in different clusters (*AWCs*). Hence, taking the variation into consideration, cluster-wise impact of capacity building was assessed.

Cluster-wise, more number of AWCs from IG showed reduction in undernutrition among the four indicators as compared to CG (Annexure 16).

The risk ratio estimates showed, that the protective effect of capacity building on underweight was noted among 26% clusters in IG (5/19) as compared to only 18% (3/17) clusters in CG. As presented in Table III-45, 12% more clusters showed a protective effect of capacity building on stunting among IG (47%, 9/19) as compared to CG (35%, 6/17). Similarly, post capacity building, 11% more clusters in IG (52%, 10/19) as compared to CG (41%, 7/17) showed a protective effect of capacity building, with reference to wasting. Finally, with regard to MUAC<-3SD i.e. SAM, a total of 43% more clusters in IG (56%, 9/16) as compared to CG (13%, 2/17) showed a protective impact of capacity building.

Table III-45 : Cluster-wise Risk Ratio Estimates of Undernutrition after Capacity Building

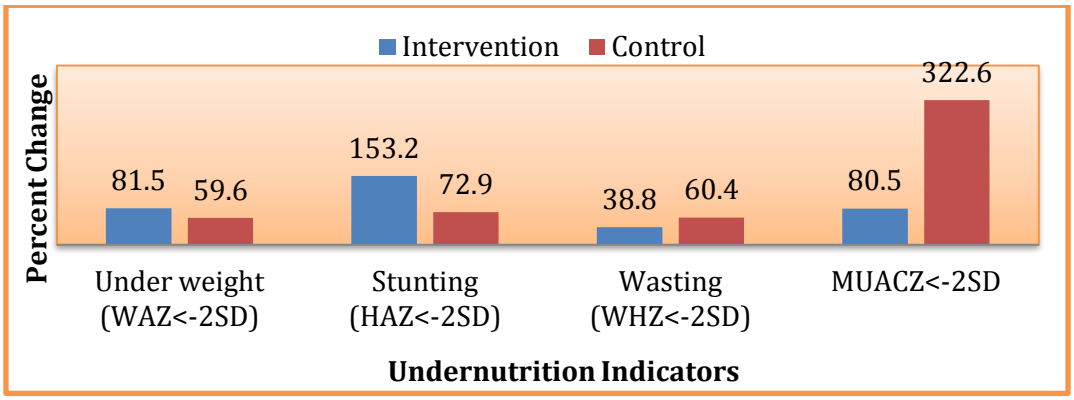
	WAZ			HAZ			WHZ			MUACZ		
	Value	Lower	Upper	Value	Lower	Upper	Value	Lower	Upper	Value	Lower	Upper
	IG											
1	1.71	0.51	5.80	1.57	0.71	3.49	2.06	0.86	4.96	0.56	0.10	2.98
2	1.70	0.84	3.42	1.18	0.71	1.96	1.53	0.91	2.60	1.73	0.97	3.10
3	1.43	0.88	2.32	1.03	0.64	1.67	1.45	0.96	2.20	1.24	0.65	2.34
4	1.52	0.93	2.50	0.95	0.53	1.69	2.09	1.36	3.22	0.94	0.44	2.02
5	0.99	0.53	1.87	0.95	0.51	1.75	1.17	0.62	2.18	0.43	0.18	1.04
6	1.02	0.42	2.43	1.39	0.59	3.27	0.75	0.27	2.08	-	-	-
7	0.65	0.27	1.56	0.31	0.05	1.85	0.78	0.33	1.84	-	-	-
8	1.36	0.51	3.63	0.92	0.38	2.21	0.73	0.31	1.69	1.33	0.46	3.84
9	1.30	0.84	2.00	1.14	0.77	1.67	1.33	0.89	1.99	1.35	0.86	2.11
10	0.82	0.46	1.44	0.73	0.40	1.33	1.04	0.56	1.92	0.44	0.08	2.48
11	1.14	0.67	1.91	0.96	0.60	1.55	0.92	0.58	1.48	0.77	0.31	1.90
12	0.88	0.56	1.40	0.85	0.50	1.45	0.93	0.57	1.53	0.73	0.26	1.99
13	0.72	0.40	1.29	1.27	0.72	2.25	0.98	0.54	1.78	1.89	1.12	3.18
14	1.15	0.67	1.96	1.05	0.58	1.91	1.43	0.85	2.40	-	-	-
15	1.89	0.87	4.11	2.08	1.09	3.96	0.89	0.39	2.01	1.21	0.50	2.96
16	1.35	0.66	2.78	0.83	0.35	1.95	1.59	0.72	3.51	0.92	0.22	3.87
17	1.11	0.72	1.72	0.90	0.57	1.44	0.81	0.51	1.27	0.97	0.60	1.57
18	1.19	0.81	1.75	1.31	0.92	1.87	0.74	0.51	1.06	1.03	0.65	1.65
19	1.49	0.79	2.81	1.11	0.65	1.91	0.88	0.50	1.54	0.55	0.23	1.36
	CG											
1	1.88	0.88	3.99	1.48	0.73	2.97	0.70	0.29	1.67	1.04	0.25	4.38
2	1.07	0.53	2.15	1.46	0.77	2.79	0.52	0.21	1.26	0.96	0.36	2.62
3	1.76	0.79	3.95	0.91	0.34	2.45	0.98	0.42	2.31	-	-	-
4	0.85	0.45	1.62	0.58	0.27	1.28	0.81	0.38	1.71	1.03	0.36	2.94
5	2.55	1.22	5.33	1.80	1.04	3.14	1.72	0.99	2.97	2.53	1.54	4.15
6	1.50	0.90	2.49	1.25	0.70	2.23	1.73	1.05	2.84	1.83	0.94	3.58
7	1.22	0.57	2.63	2.03	0.93	4.41	0.89	0.43	1.83	1.41	0.73	2.73
8	0.55	0.30	1.00	0.95	0.56	1.62	0.66	0.32	1.36	0.63	0.21	1.90

	WAZ			HAZ			WHZ			MUACZ		
	Value	Lower	Upper	Value	Lower	Upper	Value	Lower	Upper	Value	Lower	Upper
9	1.86	0.82	4.24	1.39	0.71	2.71	1.32	0.68	2.54	2.40	1.34	4.29
10	1.13	0.62	2.08	0.83	0.43	1.63	1.40	0.78	2.51	-	-	-
11	1.67	0.26	10.65	1.33	0.34	5.23	1.13	0.35	3.69	1.00	0.27	3.69
12	1.15	0.65	2.03	1.05	0.59	1.89	0.74	0.30	1.83	-	-	-
13	1.26	0.79	2.00	1.17	0.73	1.87	1.24	0.78	1.97	1.06	0.56	2.03
14	1.46	0.97	2.21	0.74	0.48	1.14	1.57	1.06	2.31	1.15	0.64	2.06
15	1.24	0.75	2.04	1.15	0.72	1.84	1.38	0.87	2.18	1.54	0.99	2.39
16	1.62	1.02	2.60	1.21	0.80	1.84	1.70	1.12	2.59	1.43	0.76	2.66
17	0.82	0.53	1.26	0.79	0.49	1.27	1.05	0.68	1.63	1.37	0.82	2.26

c) *Change in Prevalence of Undernutrition – Paired Cohort*

During the study, some children were identified who were present and assessed, both during the baseline and post intervention (capacity building), cross sectional survey. As a result, the paired data of a total of 154 children in IG, and 137 children in CG was available. The age of these children cohort at baseline ranged from 0 to 11.7 months, whereas post capacity building the age of same cohort ranged from 11.5 to 23.5 months. Since, undernutrition peaks among children around 6-23 months of age, as the age of the paired cohort advanced the prevalence of undernutrition increased in both the groups. Further, looking at the percentage of change in undernutrition for various anthropometric indices it was observed that,, the increase in prevalence of wasting (↑38.8% vs. ↑60.4%) and MUACZ<-2SD (4 vs. 1.8 times), was comparatively lesser in IG as compared to CG paired cohort, which could be the protective effect as a result of improved feeding practices post capacity building (Figure III-27).

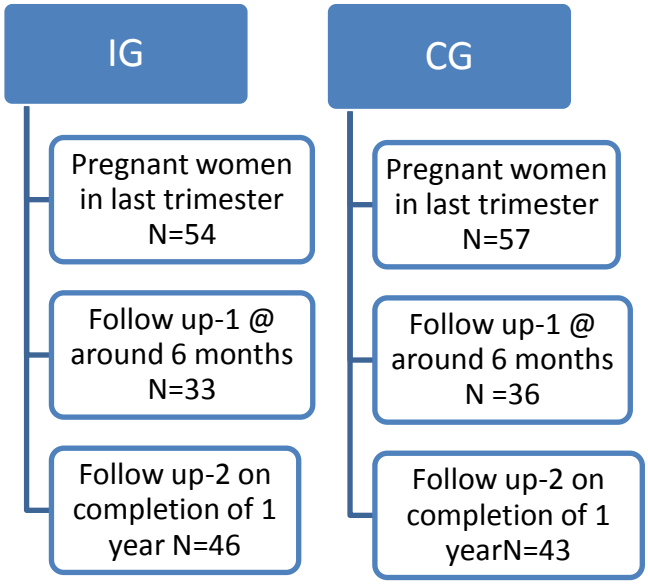
Figure III-27: Percent Change in Prevalence of Undernutrition - Paired Cohort



d) *Change in Prevalence of Undernutrition among children – In Pregnant Women Cohort*

At the baseline a cohort of pregnant women in the third trimester of pregnancy was enrolled, in the IG and CG. The objective for enrolling the cohort of pregnant women was to study the impact of capacity building on the IYCF practices and nutritional status of children born to the cohort. Two follow-ups of these mother and child pairs were made by the investigator, 1st at the time of post data collection i.e. when the baby born to the pregnant women were around 6 months of age, and 2nd when the respective baby turned one year old (Flow Chart III-1). During the study, there were 22/111 pregnant women (8 IG and 14 CG) who were lost to follow-up, due to various reasons including migration, infant deaths and miscarriages.

Flow Chart III-1 Follow-up of Mother and Child Pair



At the time of enrollment, the age of pregnant women was approximately 23 years in the IG and CG. Regarding the anthropometric measurements, comparison was also made among those women's who were followed-up till their babies turned one year old (Table III-46), i.e. excluding the lost to follow-up women. Among 46 women followed-up in IG, and 43 in CG, pregnancy and post pregnancy, height and weight measurement was available for 45 and 40 mothers' respectively. There was no statistical difference in weight of the women during pregnancy; height, and BMI (pre and post capacity building) between the IG and CG (Table III-46).

Table III-46: Profile of the Pregnant Women Cohort Covered Post Capacity Building

Groups	Group Statistics	N	Mean±SD	Levene's Test for Equality of Variances		Differences		
						Mean±SD	95% CI of the Difference	
				F	Sig.		Lower	Upper
Mothers' Weight								
IG	**Pre (Pregnancy)**	45	47.41±7.75	2.007	.160	-1.45±0.34	-4.42	1.53
CG		40	48.86±5.77					
IG	**Post (Lactating)**	45	42.65±8.29	4.577*	.035	-0.91*±0.55	-3.97	2.14
CG		40	43.56±5.36					
Mothers' BMI								
IG	**Pre (Pregnancy)**	45	15.64±2.43	0.472	.494	-0.27±0.58	-1.23	0.69
CG		40	15.90±1.95					
IG	**Post (Lactating)**	45	14.05±2.59	2.963	.089	-0.12±0.81	-1.08	0.85
CG		40	14.17±1.74					
Mother's Height								
IG	**Mothers' Height (Average of pre and post)**	45	151.45±6.05	2.514	.117	-2.27±0.06	-4.59	0.06
CG		40	153.72±4.51					

Follow up 1- Status of Mother and Children

The mean age of children during the 1st follow-up was around 8.5 months for IG (8.31±1.12) and CG (8.65±1.32), with the age range from 6-11 months.

As presented in Table III-47, prevalence of underweight and wasting was lower in IG as compared to CG, and the difference in prevalence of underweight and wasting between IG and CG was larger among males (10.4%, 26.7%) as compared to females (6.4%, 8.7%).

Unlike underweight, the prevalence of stunting was higher, by 11.8% points, among IG (39.4%) as compared to CG (27.8%), which could be due to higher height of mothers in CG group as compared to IG.

Importantly, there was not a single child in the category of SAM (MUACZ <-3SD) among the IG as compared to 8.3% children among CG categorized as SAM.

Table III-47 : Prevalence of Undernutrition among Children of Pregnant Women Cohort on Completion of 6 months

	Total		Male		Female	
	IG	CG	IG	CG	IG	CG
% Weight-For-Age (WAZ Score - Underweight)						
N	**33**	**36**	**16**	**15**	**17**	**21**
Normal	51.5 (17)	44.4 (16)	43.8 (7)	33.3 (5)	58.8 (10)	52.4 (11)
% < -2SD	48.5 (16)	55.6 (20)	56.3 (9)	66.7 (10)	41.2 (7)	47.6 (10)
$\chi 2$ (Yates corrected)	0.12		0.05		0.00	
Mean ± SD	-2.03± 1.28	-2.22± 1.35	-2.16± 1.40	-2.62± 1.51	-1.89± 1.18	-1.93± 1.18
T values	0.61		0.88		0.09	
Length/height-for-age (%) [HAZ Score – Stunting]						
N	**33**	**36**	**16**	**15**	**17**	**21**
Normal	60.6 (20)	72.2 (26)	43.8 (7)	53.3 (8)	76.5 (13)	85.7 (18)
% < -2SD	39.4 (13)	27.8 (10)	56.3 (9)	46.7 (7)	23.5 (4)	14.3 (3)
$\chi 2$ (Yates corrected)	0.59		0.03		0.10	
Mean ± SD	-1.53± 1.11	-1.34± 1.45	-1.84± 1.02	-1.66± 1.65	-1.25± 1.14	-1.11± 1.29
T values	0.61		0.37		0.33	
Weight-for-length/height (%) [WHZ Score – Wasting]						
N	**32**	**36**	**15**	**15**	**17**	**21**
Normal	65.6 (21)	50 (18)	60 (9)	33.3 (5)	70.6 (12)	61.9 (13)
% < -2SD	34.4 (11)	50 (18)	40 (6)	66.7 (10)	29.4 (5)	38.1 (8)
$\chi 2$ (Yates corrected)	1.11		1.21		0.05	
Mean ± SD	-1.66± 1.21	-1.92± 1.15	-1.78± 1.30	-2.29± 1.14	-1.56± 1.16	-1.66± 1.10
T values	0.91		1.15		0.27	
% Mid-upper arm circumference-for-age - 6 to 23 months (MUACZ score)						
N	**32**	**36**	**16**	**15**	**16**	**21**
>=-3SD	100 (32)	91.7 (33)	100 (16)	80 (12)	100 (16)	100 (21)
% < -3SD (SAM)	0 (0)	8.3 (3)	0 (0)	20 (3)	0 (0)	0(0)
$\chi 2$ (F 2-tail)	1.16		1.62		NA	
Mean ± SD	-0.93± 0.86	-1.29± 1.09	-1.12± 0.97	-1.50± 1.33	-0.73± 0.72	-0.98± 0.84
T values	1.13		0.91		0.96	

***Note**: All parameters statistically non-significant when stratified as normal and moderate*

Follow up 2- Status of Mother and Children

The mean age of children during the final follow-up was around 13 months for IG and CG. The age ranged in IG from 10.8 to 18 months, whereas in CG, the age ranged from 11.6 to 16 months; however the difference in mean age was statistically not significant.

It was observed that with advance in age the nutritional status of children in both the

group declined. However, similar to the 1st follow-up, except for stunting, the overall and sex-wise nutritional status of IG was better than CG (Table III-48).

Table III-48: Prevalence of Undernutrition among Children of Pregnant Women Cohort on Completion of 1 year

	Total		Male		Female	
	IG	CG	IG	CG	IG	CG
Weight-For-Age (%) [WAZ Score – Underweight]						
N	46	43	23	19	23	24
Normal	47.8 (22)	39.5 (17)	39.1 (9)	31.6 (6)	56.5 (13)	45.8 (11)
% < -2SD	52.2 (24)	60.5 (26)	60.9 (14)	68.4 (13)	43.5 (10)	54.2 (13)
χ^2 (Yates corrected)	0.33		0.03		0.19	
Mean ± SD	-2.15± 1.19	-2.26± 1.31	-2.24± 1.23	2.49± 1.15	-2.06± 1.18	-2.07± 1.42
T values	0.42		0.69		0.04	
Length/height-for-age (%) [HAZ Score – Stunting]						
N	46	43	23	19	23	24
Normal	56.5 (26)	62.8(27)	47.8 (11)	57.9 (11)	65.2 (15)	66.7 (16)
% < -2SD	43.5 (20)	37.2 (16)	52.2 (12)	42.1 (8)	34.8 (8)	33.3 (8)
χ^2 Yates corrected)	0.15		0.12		0.04	
Mean ± SD	-1.92± 0.87	-1.91± 1.45	-1.97± 0.98	-2.08± 1.60	-1.87± 0.77	-1.77± 1.35
T values	0.05		0.27		0.31	
Weight-for-length/height (%) [WHZ Score – Wasting]						
N	46	43	23	19	23	24
Normal	65.2(30)	55.8(24)	47.8(11)	47.4(9)	82.6 (19)	62.5 (15)
% < -2SD	34.8 (16)	44.2 (19)	52.2 (12)	52.6 (10)	17.4 (4)	37.5 (9)
χ^2 Yates corrected)	0.48		0.08		1.47	
Mean ± SD	-1.68± 1.25	-1.79± 1.21	-1.80± 1.32	-2.03± 0.95	-1.56± 1.20	-1.61± 1.38
T values	0.43		0.63		0.12	
Mid-upper arm circumference-for-age (%) (6 to 23 months) [MUACZ score]						
N	46	43	23	19	23	24
% >=-3SD	95.7(44)	95.3(41)	100(23)	94.7(18)	91.3 (21)	95.8 (23)
% < -3SD (SAM)	4.3(2)	4.7(2)	0 (0)	5.3(1)	8.7 (2)	4.2 (1)
χ^2 (Fisher extract 2- tailed)	0.20		0.01		0.00	
Mean ± SD	-1.01± 1.06	-1.04± 1.22	-1.00± 0.90	-1.35± 1.05	-1.03± 1.22	-0.79± 1.31
T values	0.09		1.16		0.65	

***Note**: All parameters statistically non-significant when stratified as normal and moderate*

Discussion: Nutritional Status of Children Under Two years

The current study, showed a positive but limited impact of capacity building, in short time span, on the nutritional status of children (U-2 yrs) in intervention group. Although the prevalence of undernutrition increased in both the groups, the increase in prevalence of undernutrition (underweight $p<0.01$, wasting $p<0.05$ and MUACZ<-2SD $p<0.05$) and reduction in respective mean z-score (WAZ $p<0.01$, WHZ $p<0.001$ and MUACZ $p<0.001$) was statistically significant in CG, whereas, in IG except for underweight ($p<0.05$), the increase in prevalence of undernutrition was statistically non-significant. Also, the prevalence of MUACZ<-2SD reduced in IG (overall ↓10.1% and females ↓20.7%), as against an increase in CG (↑46.7%).

A study by Bhandari *et al.* in 2004 Haryana showed a similar impact with the study concluding that bringing about improvement in CF practices through existing services is feasible but the effect on physical growth is limited. There was a small but significant effect on gain in length in the IG (difference in means 0.32 cm, 95% CI, 0.03, 0.61). Overall, the intervention did not affect the attained weights, the proportion of children with WAZ<2SD at 12 and 18 mo, or the increments in weight between 6 and 12, and 12 and 18 months The crude and adjusted results were similar. The IG children had a higher attained length at 12 mo ($p=0.035$) and a higher increment in length between 6 and 12 months ($p=0.035$). The proportion of children with HAZ <2SD did not differ between the 2 groups.

Similar to findings reported by Daxini and Kanani (2009) and the Dular strategy (Dubowitz *et al.* 2007), in the current study the impact of capacity building was mainly observed on the prevalence of severe undernutrition. Post capacity building, the prevalence of severe underweight (female ↓9.8%) severe stunting (overall↓6.54 and male↓10.5%) severe wasting (SAM i.e. WAZ<-3SD females ↓11.2%) and SAM i.e. MUACZ<-3SD (overall ↓35.72, male ↓1.3 times and female ↓40.7%) reduced in IG as compared to an increase in CG.

Sex-wise, the protective impact of capacity building in the current study was more prominent among males as compared to females. The RD estimates showed lesser risk of undernutrition (all 4 indicators, approximately 6.5%) among IG males; also the increase in prevalence of undernutrition (except for stunting) and respective mean z-score was statistically significant among CG males as compared to no such significant rise among IG males. Whereas among female only the mean WHZ ($p<0.05$) and MUACZ ($p<0.01$) score reduced significantly among CG females as compared to non-significant reduction among IG.

In 2004, Bhandari *et al.* also showed that test of interaction for comparison of means revealed a significant (p=0.02) interaction between gender and the intervention effect on length at 12 mo of age. The intervention resulted in a 0.51 cm and 0.37 cm higher attained length at 12 mo (95% CI, 0.03, 0.98, p= 0.039) and 18 month. (95% CI, 0.08, 0.66, p=0.02), and 8% fewer children with a HAZ <2SD (p=0.391). Weight gain was not affected. In the subgroup of female infants, there were no significant differences or clinically relevant differences between two groups.

On the other hand, an intervention study using monthly nutrition education delivered by locally trained counsellors targeted at caregivers of infants (5-11 mo.) in Karnataka showed statistically significant improvement in weight velocity for female infants in the IG. The study concluded that community-based nutrition programs that emphasise appropriate feeding and care behavior can be used to prevent and address early childhood malnutrition in poor households (Kilaru *et al.* 2005).

In a longitudinal community-based study (1997-2001) of infant growth, feeding and care practices in rural south India, monthly visit for nutrition counselling (EBF, choice of appropriate CF, feeding frequency) was made by a trained worker. Both descriptive and multivariate analyses show a statistically significant positive association between intervention and weight velocity for female infants (Ghosh *et al.* 2002).

In the current study, assessing the prevalence of undernutrition among children born to the pregnant women cohort, enrolled at baseline, it was observed that during both the follow-ups between 6-11 months and 12-18 months, the prevalence of underweight (7.1% and 8.3%) and wasting (15.6% and 9.4%) was more among CG as compared to IG. However, the prevalence of stunting was more among IG by 11.6% and 6.3% as compared to CG. Also, between the two follow-ups, the difference in prevalence between IG and CG increased with regard to underweight, whereas, the difference between two groups reduced with reference to other three parameters.

However, contrary findings have been reported in a study conducted by Bhandari *et al.* (2003) in Haryana, the health and nutrition workers in the intervention communities were trained to counsel mothers for EBF at multiple opportunities. Total 1115 infants born were enrolled for 9 mo. after training in IG (552) and CG (473) respectively. The mean weights and lengths, and the proportion with WHZ or HAZ<-2SD, at 3 months and 6 months did not differ much between groups. Also, the intervention effect on EBF, diarrheal morbidity, and anthropometry at age 6 months in the LBW subgroup was similar to that for all births. This difference in impact between

the current study and by Bhandari *et al.* (2003) may be since the age at which the enrolled children were assessed was different.

There have been several positive deviance approach projects implemented in India with the objective of improving child feeding and rearing practices. Some notable projects have been those targeted to assist ICDS projects in Rajasthan, Uttar Pradesh and West Bengal, and UNICEF assisted Dular Project in Jharkhand. The key features of these interventions have been household level counselling, similar to the current study usually by an additional community level resource worker through community participation, group meetings, and regular weighing of children. However, similar to the current study, while all studies demonstrated a small change in child care and feeding practices, the impact on nutritional status was only marginal (Ramji 2009).

In a special issue based on a WHO expert consultation on complementary feeding, Dewey *et al.* in 2003 summarized, that the effect of CF interventions on growth is variable and probably depends on the types of foods promoted, the target age range, the initial nutritional status of the infants, and the degree to which other nutrition and health messages are included in the program. When interventions include an emphasis on breastfeeding (particularly EBF for the first 6 months), not just improved complementary foods the growth effect is more likely to be observed. Thus, comprehensive approaches that address the full range of child-feeding practices are needed. The findings also indicated that program planners should be realistic about the magnitude of improvement in child growth that is achievable through CF programs. The growth response may be less dramatic than hoped, in part because postnatal growth is constrained by prenatal growth retardation and parental size. It will probably require several generations and greater attention to nutrition prior to and during pregnancy to eliminate stunting.

Later on a systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries in 2008 by Dewey et al. identified six efficacy studies and four studies/program on effectiveness as presented in Table III-49, as well as discussed later in the chapter.

A number of IYCF educational interventions on children's nutrition status conducted nationally and internationally, also show limited impact on nutritional status of children depending on several other factors and baseline status of population.

Zhang *et al.* (2013) and Shi *et al.* (2009) in a cluster-randomised, controlled trial in Laishui, China, indicated that an educational intervention delivered through local

health services can enhance caregivers' knowledge and practices of CF and ultimately improve children's growth.

The study by Shi *et al.* (2009) showed that infants in the IG gained 0.22 kg more weight (95% CI 0.003, 0.45 kg, p=0.047) and gained 0.66 cm more length (95% CI 0.03, 1.29 cm, p=0.04) than did controls over the study period. The study also concluded that improvements in linear growth were achieved by educating and motivating families to regularly incorporate animal-source foods that were available and affordable, but were not usually fed to infants.

The findings by Zhang *et al.* (2013) revealed that children in the IG achieved higher z-scores for WAZ and WHZ than the CG (0.18 vs. 0.01 and 0.49 vs. 0.19, respectively) at 18 months old, and were less likely to have stunted growth (odds ratio = 0.71, 95% confidence interval: 0.53-0.94). The mixed model analysis showed that the IG achieved significantly better linear growth over time, including WAZ (p=0.016), WHZ (p=0.030) and HAZ (p=0.078).

Intervention trials promoting education, coupled with effective communication strategies with or without food supplements, were reviewed by Caulfield *et al.* (1999). Five efficacy trials with supplemental food showed an additional 272–1254 kJ/d energy intake resulting in improvements in weight of 0.1–0.5 SD, and in 4 of these trials in which data were reported, from 0.04 to 0.35 SD in length**.**

Two recent efficacy trials in China and Brazil are also of particular interest because nutritional counseling was given without food supplements (Guldan *et al.* 2000 and Santos *et al.* 2001). In these trials, locally appropriate CF including foods rich in animal proteins and micronutrients were promoted. In the Chinese trial, IG infants were significantly heavier and longer at 12 mo of age. There was no effect, however, on weight gain and only a small improvement (0.18 SD units) in linear growth between 6 and 12 months (weight-for-age -1.17 vs. -1.93; p=0.004; height-for-age -1.32 vs. -1.96; p=0.022). The consumption of foods of animal origin such as eggs, fish, chicken, or meat and of vegetables and fruits were more frequent in the Chinese study, and baseline weights and lengths of children were better (Guldan *et al.* 2000). In the Brazilian trial, in which the intervention focused on children seeking care at health facilities, children (12 mo.) of age had significantly improved intake of fats and in weight gain. There were no significant increases in overall energy and protein intakes or lengths (Santos 2001, Table III-49)

Table III-49 : Impact on growth outcomes of interventions using educational approaches* (Dewey *et al.* 2008)

Author	Site	Target group	Study group	N	Weight	Length /height	% Underweight	% Stunted
Efficacy trials								
Penny *et al.* (2005)	Peru	Newborn	Education No intervention	171 167	-0.33±0.90 -0.62±0.83 ES: 0.34 (WAZ)	-0.81±0.80 -1.19±0.83 ES:0.49 (LAZ)		4.7 15.8 Diff:-11.1 PP
Roy *et al.* (2005)	Bangladesh	6-24 mo.	Education No intervention	93 90	0.24±0.39 -0.003±0.46 ES:0.58 (WAZ change)	-0.06±0.43 -0.11±0.61 ES: 0.09 (LAZ change)		
Vitolo *et al.* (2005)	Brazil	Newborn	Education No intervention	163 234				5.5 5.6 Diff:-0.1 PP
Santos *et al.* (2001)	Brazil	<18 mo.	Education No intervention	209 195	-0.18±0.78 -0.25±0.78 ES:0.09 (WAZ)	-0.37±0.97 -0.41±0.81 ES:0.04 (LAZ)		
Bhandari *et al.* (2004)	India	Newborn	Education No intervention	435 394	1.16±0.65 1.15±0.67 ES: 0.02 (Wt gain)	6.01±2.01 5.91±1.83 ES:0.05 (Lt gain)	54.2 52.9 Diff: +1.3 PP	50.1 51.2 Diff:-1.1 PP
Bhandari *et al.* (2001)	India	4 mo.	Education Visitation	97 91	1.93±0.57 1.84±0.72 ES:0.14 (Wt gain)	68.6±2.9 68.4±2.4 ES:0.08(Lt)		63.9 75.8 Diff:-11.9 PP
Programmes								
Guyon *et al.* (2006)	Madagascar	6-23 mo.	Post-intervention Pre-intervention	NA NA	-1.57±1.16 -1.50±1.16 ES:-0.06 (WAZ)	-1.87±1.00 -2.01±1.00 ES: 0.14 (LAZ)	38 34 Diff: +4 PP	45 49 Diff: -4 PP
Maluccio and Flores (2004)	Nicaragua	0-59 mo.	Education (+income)	NA NA		0.14±1.1 -0.03±1.65	10.0 16.0	37.0 42.0

Author	Site	Target group	Study group	N	Weight	Length /height	% Underweight	% Stunted
			No intervention			ES:0.12(LAZ)	Diff: -6.0 PP	Diff: -5.0PP
Guldan *et al.* (2000)	China	0-12 mo.	Education No intervention	250 245	-1.17±0.79** -1.93±0.79** ES:0.96 (WAZ)	-1.32±1.00 -1.96±1.00 ES:0.64 (LAZ)	0 3 Diff:-3 PP	5 2 Diff: -3 PP
Kilaru *et al.* (2005)	India	5-11 mo.	Education No intervention	173 69	0.25±0.18## 0.22±0.18# ES:0.16 (Wt velocity)			

Diff, difference; ES, effect size; LAZ, length-for-age z-score; NA, not available; PP, percentage point; WAZ, weight-for-age z-score. *Weight (Wt) and length/height (Lt) refer to the growth outcome shown in parentheses (units: Wt in kg; Lt in cm), which is also the outcome that gave the largest effect size in studies that reported more than one weight or length outcome. For Bhandari *et al.* (2004), weight and length gains are averages for 6–12 and 12–18 mo. For Guldan *et al.* (2000), differences remained significant when adjusting for potential confounders, but only unadjusted values were reported. Italicized SD values are estimates. †Means are significantly different ($P < 0.05$). ‡Significant difference observed only in subsample: Brazil (Santos *et al.* 2001), children _12 mo. of age at baseline; India (Kilaru *et al.* 2005), females. §Significant difference observed only between 6 and 12 mo. (ES = 0.17), and for males at 18 mo. (ES = 0.11). ¶Significantly different at 10% level. **SD values are estimates from subjects of similar age from Vietnam (Schroeder *et al.* 2002). ††SD values are estimates, assuming LAZ has N (0, 1) distribution. ‡‡SD values are estimates from subjects of similar age from Congo (Moursi *et al.* 2003).

Viewed together, the available studies suggest that the effect of educational interventions may vary depending on the baseline characteristics of the participants and other factors such as the types of foods available. The observed effect on length and not on weight gain call for examination, however, there are some possible explanations worth considering from the following studies:

1. Breast-feeding practices during the 6 to 9 month period improved as a result of promoting EBF during the first 6 months of life and continued breast-feeding thereafter. Breast-feeding was reported to have a stronger effect on linear growth than on weight gain during late infancy and preschool years (Onyango 2000, Onyango *et al.* 1999).
2. Hygiene promotion was a part of the intervention, and improving hygiene and sanitation are also reported to improve linear growth (Esrey *et al.* 1992).
3. The complementary foods whose reported intake was substantially increased were milk based gruels or cereal-pulse mixes, which may improve nutrient quality in this setting (WHO 1998a).

This study has important implications for CF programs. Although it shows that educational interventions can improve feeding practices, the effect of such interventions on physical growth varies in different settings.

Future research should focus on explaining why the growth effect of nutritional interventions is limited in some regions such as south Asia.

CHAPTER 6: SUMMARY AND CONCLUSIONS

An estimated 3,564 of the world's children under 5 years die each day (1,301,000 each year) from causes that are preventable by optimal breastfeeding. In addition, for every child who dies, hundreds of others are sick and miserable from illnesses preventable with optimal breastfeeding - Jones et al. 2003

Although, approximately 20% of the world's children are in India, India contributes to disproportionate share of human development problems including a very high maternal and under 5 mortality (UNICEF 2007a). Among the key causes of mortality in children under 5 years, undernutrition contributes more than one-third child deaths (Black *et al.* 2008).

Undernutrition patterns are similar globally. Most undernutrition happens in the first two years of life, after that it tracks at the same level. Much of this early damage is irreversible, thus targeting children either before birth, or in the first two years of life, and this period could serve as the "***Window of Opportunity***" (Shrimpton *et al.* 2001). According to the lancet series of child survival, optimal breastfeeding and complementary feeding (CF) practices can prevent 19% of child deaths below 5 years in India (Jones *et al.* 2003).

The National Family Health Survey (NHFS) – 3 conducted in 2005-06 shows very high levels of malnutrition (40.4% children below 3 years as underweight) in India, with prevalence even higher in Gujarat. In Gujarat 49.2% children below 3 years are stunted reflecting failure to receive adequate nutrition over a long period of time and also recurrent and chronic illnesses (NFHS-3 Gujarat 2008). As per the District Level Household and Facility Survey (DLHS) – 3 conducted in 2007-08 for Gujarat, only 19.5% children (6-24 mo.) met all the three criteria of optimal Infant and Young Child Feeding (IYCF) practices i.e. children of 6-24 months of age who were, breastfed within 1 hour of birth, exclusively breastfed for first six months, and after six month presently receiving solid and semi-solid food along with continued breastfeeding (DLHS-3 2010).

In India Integrated Child Development Services (ICDS) is a well-designed intervention and well-placed to address many of the underlying causes of undernutrition in India. For its services to be effective in combating undernutrition, however, the programme needs to be implemented in an efficient and equitable manner (Gragnolati et al. 2006).

Educating mothers on correct breastfeeding practices and child nutrition in the community is one of the components of the ICDS programme in India, in which the ICDS *Anganwadi* workers (AWWs) and their Supervisors can play a vital role for the promotion of community based optimal IYCF practices.

Globally and especially in India, Growth Monitoring and Promotion (GMP) is widely recommended as a community based tool for child survival. The use of growth monitoring extends beyond problem detection; it has been used to provide a basis for communicating with mothers on child health and nutrition by stimulating caregivers' thinking about the causes of poor growth and malnutrition (ACC/SCN 1990a).

To be effective in reducing child malnutrition and mortality, GMP (Ashworth *et al.* 2008)

- Must be accompanied by community-based health and nutrition interventions
- Prioritize infants and children aged 0–18 months
- Utilize all child health contacts for nutrition counseling
- Improve training, supervision and support for health workers

Nevertheless, over the years, various studies have reported weaknesses in ICDS programme delivery, including incorrect weighing and plotting (Kapil *et al.* 1996), failure to identify children with growth faltering and lack of nutrition counselling (Lalitha and Standley 1988; Gopaldas *et al.* 1990) and might explain the programme's lack of impact. Also, the studies of various GMP programs have shown that inadequate training of health workers, especially in equipping and enabling them to provide effective counseling has been identified as a very important factor contributing to the poor quality of implementation (Marek *et al.* 1999 and Kapil *et al.* 1996)

Too often, the performance of the AWWs is constrained by poor quality training and the pressure of a large and disparate workload. Survey data show that pre-service training is scarce with most AWWs undergoing short-term in-service training (Bredenkamp and Akin 2004). More resources have been directed towards strengthening capacity at the central, state and block levels to provide high quality support and training to functionaries of ICDS programmes (Gragnolati *et al*. 2006).

In Gujarat the major focus of *MAMTA DAY* (Village Health and Nutrition Day) is growth monitoring and promotion, and counseling on IYCF practices, which are expected to bring about change in the IYCF practices of parents and caregivers and eventually reduction in malnutrition. For this, it is very important that the AWW is perceived and treated as the core input for ICDS service delivery on *MAMTA DAY* and given the right tools and trainings in this effort to prevent and reduce

undernutrition.

The **proposed trial** aimed to measure the impact of the above child-nutrition educational interventions implemented through ICDS services answering the following research question;

Whether capacity building of ICDS functionaries, on growth monitoring and promotion, and infant and young child feeding practices can bring about a required change in the infant and young child feeding practices of parents and care providers, and eventually a reduction in undernutrition among children under two years?

The broad objective of the study was: "To build the capacity of *Anganwadi* workers of ICDS scheme on growth monitoring and promotion, and infant and young child feeding, and to assess its impact on infant and young child feeding practices and nutritional status of children under two years."

For the present study, two ICDS *Seja (*group of approximately 20 AWCs*)* with similar nutrition profile (27% and 28%), and weighing efficiency (90% and 92%) for children under three years as per the Monthly Progress Report (MPR), April 2008 were purposively selected as Intervention Group (IG, 19 AWCs) and Control Group (CG, 17 AWCs) respectively.

The capacity building of IG AWWs, on GMP and IYCF practices, was conducted over a span of 6 months, which included group and hands-on capacity building (individual on-the-job). The techniques used for capacity building were lectures, discussions and practical sessions, demonstrations and on-the-job training. The focus was to enhance the counseling skills of AWWs and prioritize the GMP and IYCF counseling on *MAMTA DAY* and during home visits.

All the AWWs (17+19), from intervention and control group, and their Supervisors (2) were assessed pre and post capacity building, regarding their knowledge and perceptions on IYCF and GMP. The in-depth interview of AWWs and Supervisors was scored 1 point (score) per AWW for each preferred response. Mean score for 24 key areas (including IYCF, GMP and Interpersonal counselling i.e. IPC skills) were calculated taking mean of all the responses of all AWWs. Negative marking was done only in CF section while assessing knowledge and perceptions about the type and consistency of food. This was only when AWWs listed thin liquid foods as CF. Independent T-test was applied for pre and post mean scores between IG and CG, whereas paired T-test was applied within IG and CG mean score, pre and post capacity building.

In each group, all children below 2 years (~600 in each group) were studied for anthropometric measurements (Health, Weight and MUAC). Further, to measure 20% improvement in EBF (47.8% to 67.8%) and 15% improvement in IYCF practices

(20.1% to 35.1%) at 80 power, 95% CI, 120 children U-6 months and 170 children between 6 to 23 months i.e. a total 290 children between 0 to 2 years (NHFS-3 and Epi Info 6.04d) were randomly selected, using a random number table generated through Epi info .04. This included additional 10% to take care of possible dropouts (incomplete information) from the study. The summary of the major study findings and learning is presented and discussed as under;

I. Knowledge and Perceptions of the *Anganwadi* Workers and Supervisors

The AWWs (19 IG + 17 CG) and ICDS-Supervisors (n=2) were aware of key IYCF practices; however, their perceptions and knowledge with regard to the rationale applicable to the appropriate recommended IYCF and GMP practices being promoted was rather poor. This is noted to be a critical gap and needs to be addressed for equipping the ICDS frontline workers in effective promotion and successful adoption of IYCF practices by the community, further reiterating the need for strengthening the knowledge, attitude and practices of frontline workers, for enhancing community based IYCF practices.

Key IYCF Practices

Correct knowledge and perceptions of Supervisors and AWWs, with reference to each of the IYCF practices is very important, for formulation of simple, understandable, logical messages and for convincing communities to adapt to optimal IYCF practices. However, baseline assessment showed that only 3/36 AWWs stated correctly all three key IYCF practices i.e. Early Initiation of Breastfeeding (EIBF) within one hour of birth of birth, Exclusive Breast Feeding (EBF) for the first six months and introduction of complementary food (CF) with breastfeeding from 7 months onwards, correctly. The major gap was with respect to the knowledge related to CF practices. Many AWWs referred to starting CF with thin liquid diet and while emphasizing on initiating CF from 7th month onwards, most of the AWWs missed out referring to continue breastfeeding till 2 years and beyond,

Breastfeeding

Although 86% AWWs were aware of EIBF within one hour of birth, none of the AWWs and ICDS Supervisors listed mother and child survival as one of the key benefits of EIBF. Similarly, the AWWs were aware that prelacteals can be infectious (78%) and unhygienic (31%); however, none of the AWWs and ICDS Supervisors knew that prelacteals may contain medications which may be harmful for the baby; in

fact, such message may be useful to encourage caregivers to avoid giving prelacteal feeds.

Also, none of the AWWs gave complete definition of EBF, which might be very critical for mothers to understand and practice EBF. The AWWs missed listing some very important benefits like “EBF baby doesn’t require water even during hot seasons” etc, which could be critical to convince and inspire community to ensure EBF.

For ensuring EBF, mothers need to be educated and supported from time to time on frequency, duration and adequacy of breastfeeding, as well as about various breastfeeding methods. Only 31% AWWs recommended on demand feeding, only 3/36 AWWs and 1/2 ICDS Supervisors mentioned frequency as “*minimum* 8 to 12 times”. On an average AWWs could list only 4-5, whereas the ICDS Supervisors listed 10 out of 11 signs of attachment, positioning and sucking, essential to ensure successful breastfeeding.

Only 19% AWWs recommended checking weight to resolve mothers’ complain of ‘*Not Enough Breast Milk’* and none of the AWWs and Supervisors recommended checking frequency of urination despite IMNCI training, reflecting very poor knowledge of AWWs regarding assessing the adequacy of breast milk. Also, only around one third AWWs and one Supervisor had complete knowledge about reasons for breastfeeding at night, breastfeeding in side-lying position and use of both breasts. This poor knowledge and perceptions of AWWs would have a direct impact on mothers’ failure to EBF the child.

The perceptions of AWWs and their Supervisors on breastfeeding baby during pregnancy were also based on their field learning, reemphasizing the need for enhancing the capacity of frontline workers, so as to offer appropriate guidance to mothers, during such circumstances.

With reference to the knowledge of AWWs about continuation of breastfeeding during sickness of the mother, although 94% agreed that breastfeeding should be continued in sickness, discussing further, mentioning some major sickness, the percent of AWWs agreeing to the need for continued breastfeeding reduces further. Also, the knowledge of AWWs and their Supervisors regarding breastfeeding during breast problems was very poor with only 42%, 39% and 19% AWWs recommending continuing breastfeeding during conditions like cracked nipples, breast engorgement and breast abscess respectively. This revealed a huge gap in the knowledge of AWWs and their Supervisors. In the community where such situations exist, without proper guidance, these would lead to failure in EBF and breastfeeding in such cases.

Complementary Feeding

Almost all AWWs (97%) and both Supervisors stated the correct age of initiation of CF; however, only 14% AWWs were aware of continuation of breastfeeding till two years. Also, none of the AWWs knew the complete rationale for promoting breastfeeding till 2 years and beyond, representing poor capacity to convince community for the same.

Although the knowledge of AWWs about the consistency of CF was adequate, with 78% AWWs recommending mashed food from 7th month onwards, there was a wide gap between the knowledge and perceptions of AWWs; with only 44% AWWs further recommending foods with thick consistency and 67% recommending liquid diet for children. These practices, in fact, are one of the primary reasons which can be attributed to low energy and protein intake during complementary feeding.

With reference to CF during illness, only 6% AWWs advised on continuing breastfeeding and 22% advised on giving small frequent feeds. Only 22% AWWs and 1/2 Supervisors advised giving additional meal after illness. None of the AWWs recommended persistence in feeding the child with required quantity of food.

Care during Feeding

The knowledge of AWWs and their Supervisors on care during feeding was poor; only 2-4 of 11 care practices were identified. Also, the perception of AWWs on early signs of hunger and poor appetite in children were limited to crying and sickness.

Growth Monitoring and Promotion

Around 81% AWWs recommended weighing child every month, only 64% AWWs listed growth monitoring as an important tool for measuring growth and or detecting growth faltering and only 33% AWWs related it as a tool for giving appropriate advice based on the child's nutritional status. None of the Supervisors could enumerate all key actions that follow by weighing. This finding, calls for a need to address the gaps in knowledge of AWWs and Supervisors and to enhance their capacity in GMP, which is an important tool for addressing undernutrition.

Inter Personal Counseling

The AWWs and their Supervisors could identify two to three of the five key steps in effective counseling which included listening, praising the mother wherever appropriate and asking checking questions. This again showed a below average knowledge of AWWs and their Supervisors, which could be one of the principal barriers in bringing about behavior change, while promoting community based optimal IYCF practices, as well as, various other interventions requiring IPC.

II. Undernutrition prevalence, and associated infant and young child practices of the care providers of the children under two years

A. Background characteristics of Households

Among the sampled households, a majority of the households were Hindus (99%), belonging to OBC, SC and ST category (89%) and falling in the upper lower status (71%) according to the Kuppuswamy's SES scale – 2007. Further, 97% households had protected source of drinking water, however, the household sanitation condition was poor, with only 23.9% households having toilet facility and 78% families practicing defecation in the open.

Around 27% women in the study population (having children U-2 or pregnant women) had no prior schooling or education, and 5% mothers of children (U-2) and 3.4% pregnant women were engaged in semi-skilled work like farming on daily wages.

With reference to birth weight and immunization, the status of current study area was better as compared to previous studies; in the current study 19.3% children U-2 years were LBW, and 86.6% children (12-23 mo.) were vaccinated upto measles vaccine, whereas NFHS-3 2005-06 showed 22% children born as LBW (NFHS-3 Gujarat 2008) and DLHS-3 2007-08 showed 73.4% children in rural Vadodara vaccinated upto measles (DLHS-3 2010).

The MCH services particularly ANC checkup were availed of by a larger number of mothers with children below 2 years (85.2% 3 or more ANC checkup) during pregnancy. As a result, not only the full ANC coverage, but 73.3% institutional delivery rates in the present study area were better than the DLHS 2007-08 institutional delivery rates for Gujarat state 56.4% and Vadodara district 54.4% (DLHS-3 2010).

B. Infant and Young Child Feeding Practices

Breastfeeding

Knowledge and Perceptions on Breast Feeding Practices

The knowledge and perceptions related to optimal breastfeeding practices was 40% among Pregnant Women (PW) and 45% among Lactating Mothers (LM). Further, the knowledge about early breastfeeding practice ranged from 39-40% (EIBF and colostrum feeding) to 20% (avoiding prelacteals). Around 44% lactating mothers and 23% pregnant women knew about EBF and, most of them 47.2% and 53.7%

recommended continued breastfeeding for around 12-23 months, whereas only 13% pregnant women and 16.8% lactating mothers were aware of continuing breastfeeding till 2 years and beyond.

Breastfeeding on a time schedule and on demand breastfeeding was recommended by 46.3% and 42.6% pregnant women and 71.9% and 25.6% lactating mothers respectively, whereas, only 25% women (pregnant and lactating) had correct knowledge about the minimum frequency and duration of breastfeeding, and around 30% of them had an incorrect perception that, child should be breastfed for around 5 to 10 minutes only. The perception of women about offering second breast when one breast gets empty, during each breastfeed (PW 85% and LM 90%) and initiating breastfeeding from alternate breast (PW 69% and LM 79%) during every new feed was satisfactory.

Lastly, the correct knowledge about indicators for "Not Enough Breast Milk" was negligible, with majority of the mothers relating crying (24.1%) as an indicator of "Not Enough Breast Milk".

Not many women were aware of the benefits of breastfeeding.Around 25% women were aware that breastfeeding enhances baby's immunity, whereas, 14% lactating mothers perceived breast milk as good for baby.

The outcome of knowledge and perceptions of women about the impact of breastfeeding on mother's health and pregnancy were also very poor, while 51.9% pregnant women and 78.4% lactating mothers recommended taking extra diet during pregnancy and lactation, only 9.9% lactating mothers and 12% pregnant women knew that breastfeeding helps in delaying next pregnancy, 25% pregnant women and lactating mothers recommended continuing breastfeeding during pregnancy, and 38.1% lactating mothers and 47.2% pregnant women knew that breastfeeding can help mothers to reduce weight.

Counseling on Breastfeeding Practices

Overall, 71% lactating mothers had received breastfeeding counselling during the last pregnancy. The association between ANC checkup visits and breastfeeding counseling was statistically significant ($p<0.01$) among those mothers who had more than 3 ANC visits.

Even though around 50% (colostrum feeding, no prelacteal feed etc) to 70% (EIBF) women were counseled about early and optimal breastfeeding practices, during *MAMTA DAY* (Village Health and Nutrition Day), the counseling by AWWs was low: 10% (no prelacteal feed) to 15% (EIBF) during pregnancy, and 8% (EBF) to 12% (BF attachment, positioning) post natal.

Status of Breastfeeding Practices

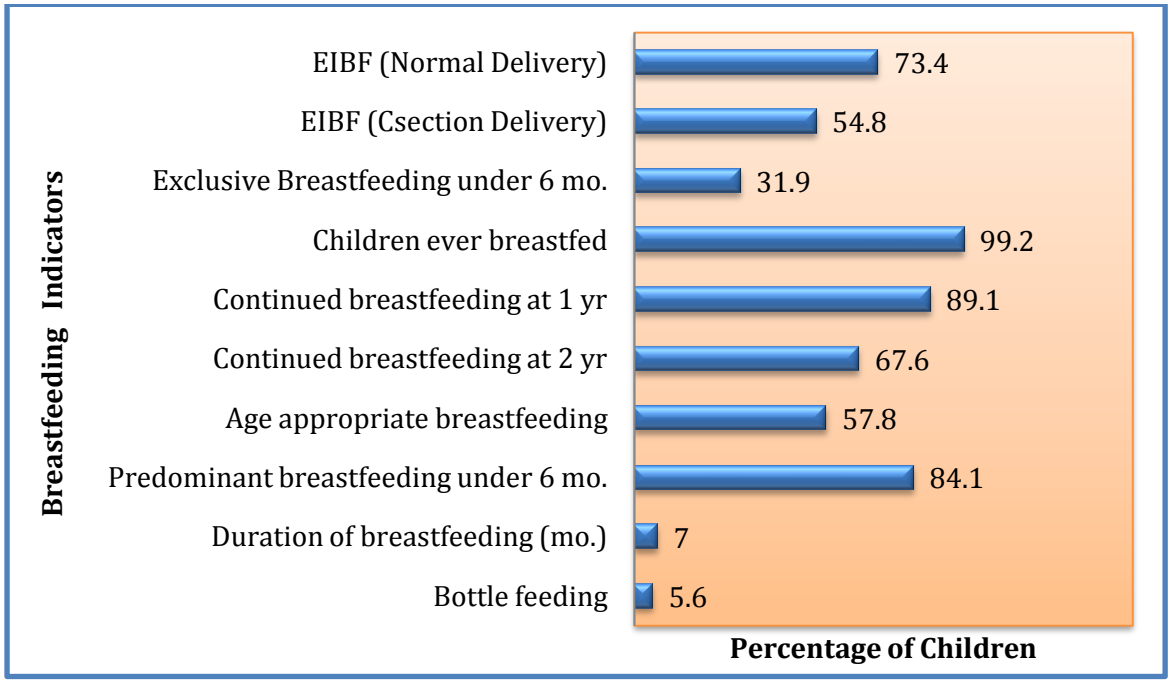
As presented in Figure IV- 1, EIBF within one hour of birth was 73.4% among normal delivered infants and 54.8% among infants delivered through C-section, initiated within four hours. The study also reported prelacteal feeding immediately after birth as 36.5%, which commonly included "*Patasa water" or Jaggery*. Colostrum was fed in, around 60% neonates and additionally 29% reported having fed colostrum, after discarding first few drops, owing to family rituals and false beliefs.

Overall, the EBF rate among the children below 6 months was only 31.9%; this also correlated with the finding that only around 47% mothers fed a minimum of 8 to 12 breastfeeds in 24 hours preceding the survey and thus followed the correct feeding practices.

The continued breastfeeding rate dropped from 89% at 1 year (12-15 mo.) to 68% at two years (20-23 mo.) indicating that a total of 11% of the mothers were not offering breast milk to their children at one year, and around a third of mothers stopped breastfeeding by two years of age.

Among children below 6 months, the problems in breastfeeding were reported by 8.6% mothers, with majority of the mothers experiencing problems such as insufficient milk (57.9%) and breast engorgement (36.8%), of which, around 42% of mothers, discontinued breastfeeding, as a result of problems in breastfeeding. Findings also revealed 8.4% use of bottle-feeding among children (0-12 mo.) and the current bottle feeding rate was lower, 5.6%.

Figure IV- 1: Status of Breastfeeding Indicators (%)



Complementary Feeding

Knowledge and Perceptions on Complementary Feeding Practices

Only 30.9% mothers (children 0-6 mo.) were aware of the correct age of introduction of CF and 15.5% recommended introduction of top milk before 6 mo and only 18.8%, mothers of children below 1 year perceived that the child can eat food from family pot by 1 year of age.

Besides poor knowledge about optimal CF practices, a majority of the mothers were also not aware of the consistency and frequency of CF. Most of the mothers recommended very thin liquid like consistency, and only 5.7% and 19.6% mothers recommended thick and solid foods (mainly biscuits). The correct feeding frequency was recommended by 30% (3 times for children 7-11 mo.) and 12% (5 times for children above 12 mo.) mothers of children below 1 year, respectively. Also, only 24.5% mothers were aware of increasing the number of meals and/quantity of food during illness.

The knowledge and perceptions assessment, regarding responsive feeding showed that only 22.8% mothers of children below 1 year knew that the child can eat on its own at around 2 years and 83% mothers of children below 2 years believed that the caregiver should sit and monitor how much a child eats.

Inquiring about mother's response to child's refusal to complete the given food, a majority of the mothers advised to leave the child (34.3%) following the laissez-faire style, 30.3% believed in encouraging the child (responsive feeding style), 10.3% recommended offering alternate foods to the child and 4.5% recommended force feeding.

Thus, overall the knowledge and perceptions of mother's about optimal CF practices was below average (below 50%), again reemphasizing the need for enhancing the capacity of frontline workers to improve the KAP of caregivers of below 2 years about optimal CF practices, and eventually bring about reduction in undernutrition.

Status of Complementary Feeding Practices

The CF practices of mothers/caregivers of children 6-23 months, were analysed based on the Guiding Principles for Complementary Feeding of the Breastfed Child (WHO/PAOH 2003); and using the WHO 2010 indicators for assessing IYCF practices.

The status of CF practices showed that although 92.2% children (6-23 mo.) were receiving CF, only 37.9% children 6-23 months and 69.2% children 6-8 months initiated CF on completion of 6 months. Early introduction of CF before 6 months and delayed introduction of CF beyond 8 months were reported in 11.9% and 24.8%

children (12-23 mo.) respectively.

The mean age of introduction of CF (12-23 mo.) and top milk (6-23 mo.) was 7.6 months and 7.9 months respectively. Overall, 40.5% children received top milk, and, 11% were introduced top milk before 6 months of age.

More importantly, the quantity of CF given to breastfed and non-breastfed children was very less, as compared to the recommended IMNCI/*MAMTA* card guidelines. A majority of children were given as little as 50 to 80 ml per serving. Only 1.6% breastfed children (9-11 mo.) consumed recommended quantity of CF (200 ml) per serving, whereas none of the children above 1 year consumed the recommended quantity of CF (>200ml) per serving. Further, only 40% and 74% children 6-8 months and 9-23 months, respectively consumed the CF with appropriate consistency, which is very important to ensure adequate energy density of CF.

The dietary diversity in CF, was even poorer, with only around one quarter of children (6-23 mo.) consuming food from at least 4/7 major food groups listed to ensure proper dietary diversity in CF (Figure IV-2). The dietary diversity improved as the age advanced, the dietary diversity was the least among 6-11 months breastfed children (16.5%) and the maximum among 18-23 months non-breastfed children (63%). Also, the median number of food groups consumed by children (6-23 mo.) was only 2 in 24 hours preceding survey, which was less than the minimum dietary diversity, whereas with increase in age the median number of food groups consumed increased from 2 to 4.

Around 56% children (6-23 mo.) were fed as per the recommended norms of minimum feeding frequency (Figure IV-2). Among the breastfed, the minimum meal frequency was better among children in the younger age group (6-8 mo., 66.7%) as compared to the older age group (9-23 mo., 57.8%). Also, the minimum meal frequency among breastfed was better than among non-breastfed.

The minimum acceptable diet was received by only 15.8% children, in the 24 hours preceding the survey, presenting a very poor picture (Figure IV-2). The milk feeding frequency of non-breastfed children (6-23 mo.) showed that around 72% consumed more than one milk item; only 21% consumed at least 2 milk items in the24 hours preceding the survey (Figure IV-2). Around 81% children were breastfed in 24 hours preceding the survey. The consumption of all the seven food groups was below 50%, except for the consumption of cereal grains, roots and tubers (87%). Less than half of the children were fed legumes and nuts, and over three-fourths were fed dairy products. The consumption of other fruits and vegetables was only 24%. Non-vegetarian food and egg was consumed by only 1% to 2% children respectively. Other than the routine homemade food, around 72% children (6-23 mo.) consumed

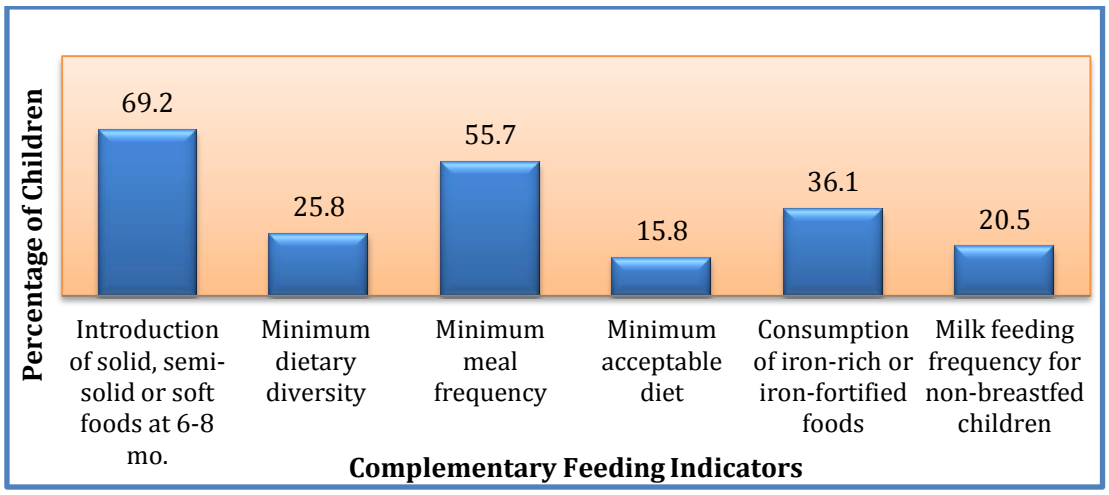
outside snacks including beverages, packaged snacks, ice creams and chocolates. The consumption of all food groups was better among non-breastfed, as compared to the breastfed children, except for '*Balbhog'* and biscuits which was surprisingly consumed more among breastfed children as compared to non-breastfed.

Even though the use of at least one energy dense food like oil, ghee, sugar and jaggery in cooking was universal (92%) only 35% families' practised top addition of these items for children to enhance the energy density of CF.

The consumption of iron-rich foods (i.e. fortified *Balbhog*, GLV, egg and flesh foods) excluding any supplement was around 36%; also, the consumption was better among non-breastfed (43.9%) as compared to breastfed (38.6%) children. The major source was ICDS fortified *Balbhog* (32.7%), whereas flesh foods and egg contributed to only around 0.9%. The consumption of IFA tables at least once was reported by only 7% children.

Assessing the breastfeeding practices of children during diarrhea, it was found that only 83% children were breastfed among those who suffered from diarrhoea. The hand-washing of children (6-23 mo.) before eating was practised by 82.4% mothers; however only 33.5% washed their hands using soap and water.

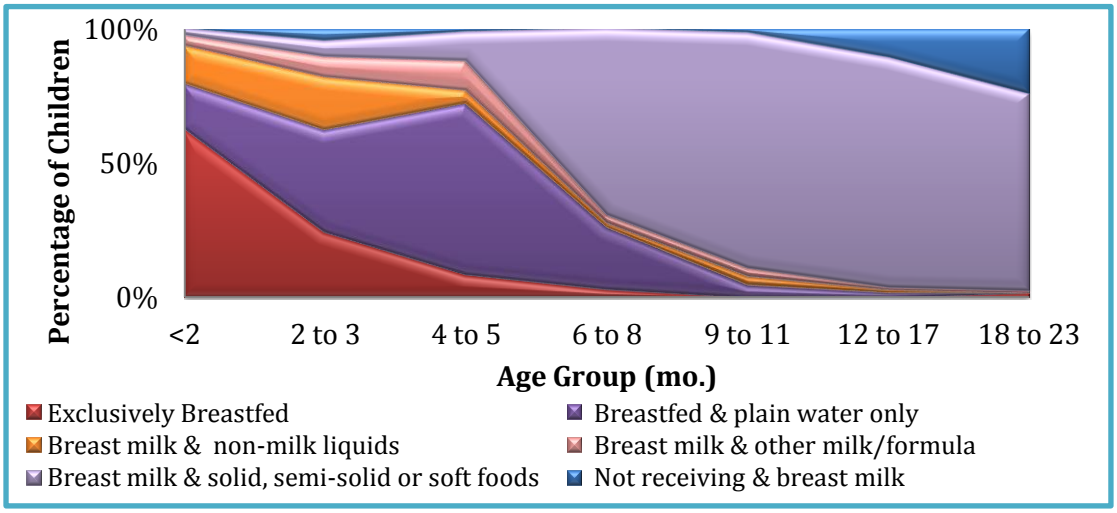
Figure IV-2: Status of Complementary Feeding Indicators 6-23 months (%)



IYCF Practices

The detailed age-wise analysis of IYCF practices shows that the EBF rate reduced to as low as 3.1% among children 6-8 months of age (Figure IV-3). Also, the introduction of plain water in the study area was as high as 16.7% among children below 2 months and peaked at 4-5 months to 63.4%. Only around 69.2% children were introduced CF, along with breast milk, at around 6-8 months. The percent children not receiving breast milk increased from 1.6% at around 9-11 months to 24.1% by 18-23 months of age.

Figure IV-3: Infant and Young Child Feeding Practices by Age (%)



C. Utilization of Integrated Child Development Services for Children Under Two Years

Growth Monitoring and Promotion (GMP)

There was an incomplete implementation of the GMP activity in the field. Although 91.4% children were weighed at the AWC on *MAMTA DAY* or during home visits, only 68.5% reported being weighed regularly every month. Although 30.6% had plotting on *MAMTA* card, only 16.6% reported plotting on *MAMTA* card following the weight measurements. Overall, only 7.2% children had 100% or more plotting on *MAMTA* card, whileonly 5.1% reported plotting on *MAMTA* card by AWW.

Such poor implementation of GMP has a direct impact on the parent's awareness of their child's nutritional status. As a result, only 18.4% parents were aware of their index child's correct nutritional status (healthy/malnourished), weight and color on growth chart. Thus, it can be concluded that there was a minimal use of GMP as an IPC tool, by the AWWs for educating mothers about their child's nutritional status and related IYCF practices.

Village Health and Nutrition Day (*MAMTA DAY*)

Although 98% respondents (mothers of children below 2 years and pregnant women) attended *MAMTA DAY*, only around half of the respondents reported having attended the last *MAMTA DAY* celebration in their respective area. Further, only around 13% mothers of children below two year and 22% pregnant women knew it as "*MAMTA DAY*". Importantly, the *MAMTA DAY* venue was within 10 minutes reach for 80-90% participants; however, only 13% to 14% were correctly and 22% to 23% were partially aware of the *MAMTA DAY* schedule.

Awareness and Utilization of* MAMTA *Card

The use of *MAMTA* card by AWWs as a tool for IPC and behavior change communication (BCC), especially on child care practices, was low, with only 31% mothers counseled from the *MAMTA* card and only 9% explained by AWWs.

Among those who were counseled, the *MAMTA* card was used least for counseling about GMP (<4%) and IYCF messages (<20%). As a result, less than 20% mothers reported having referred the *MAMTA* card and only around 12% mothers could understand the growth chart colors and or IYCF messages from *MAMTA* card.

***Balbhog* Supplementation**

Around 84% mothers received *Balbhog* for their children and 72% reported having received in the previous 1 month. The contribution of AWWs in counseling and demand generation for *Balbhog,* for enhancing the feeding practices of children below 3 years, was only around 55%.

The *Balbhog* distribution, as reported by mothers, was mostly as and when the stock arrived *(*60.5%). Only 28.3% reported receiving *Balbhog* every month, and 3.2% reported having received *Balbhog* on *MAMTA DAY*.

The monthly supply of 7 packets was normally distributed in parts with a majority of mothers (59.7%) receiving two packets at a time, and not a single mother reported having received all 7 packets during her last reciept.

The end use of *Balbhog* was 69%, whereas the positive impact of *Balbhog* on child's health was perceived by less than 50% mothers of children 6-23 months.

Although 62.2% families stated giving *Balbhog* daily (6-7days) only 40.4% actually fed *Balbhog* on the day preceding the survey. The weekly frequency was higher among older age group (43%, 12-23 mo.), as compared to the younger age group (24%, 6-8 mo.).

Similarly, even though 48.2% families reported feeding *Balbhog* more than once, only 41.2% actually fed more than once during 24 hours preceding the survey. The two main reasons for not feeding *Balbhog* were the child disliking it (24/52) and the child not eating anything (20/52).

D. Nutritional Status of Children Under Two Years

Among the survey population, the prevalence of underweight was the highest (48.8%), followed by almost a similar prevalence of wasting (36.3%) and stunting (36.2%). The prevalence of SAM among children 6-23 months of age was 3% by MUACZ<-3SD criteria and 11.7% by WHZ<-3SD criteria respectively.

Sex-wise, the prevalence of undernutrition and severe undernutrition was higher in males, as compared to females, except for severe wasting. The prevalence of underweight ($p<0.05$), stunting ($p<0.01$) and severe stunting ($p<0.05$) was significantly higher in males, as compared to females. The mean WAZ and HAZ scores was significantly higher ($p<0.05$ and $p<0.01$) among females by 0.18 and 0.05 z-score respectively as compared to males.

Between the age groups, the difference in prevalence and mean z-score was significant for all anthropometric indices. The prevalence of undernutrition was the highest among children in the age group of 12-23 months (underweight 58.8%, stunting 48.3%, wasting 40.9%, SAM by MUACZ<-3SD 4.1%), as compared to other age groups and as compared to the overall prevalence and sex-wise prevalence undernutrition.

E. Factors Affecting the Nutritional Status of the Children under Two Years

The prevalence and odds of wasting was significantly higher among children belonging to lower SES (OR 1.70, CI 1.10-2.62, $p<0.05$), drawing unsafe drinking water from the container (OR 1.72, CI 1.20-2.48, $p<0.01$), males (OR1.30, CI 1.00-1.68, $p<0.05$), age group of 12-23 months (OR 2.52, CI 1.83-3.48, $p<0.001$), LBW (OR 1.97, CI 1.03–3.80 , $p<0.05$) and with history of diarrhea 15 days preceding the survey (OR 1.85, CI 1.15-2.97, $p<0.05$).

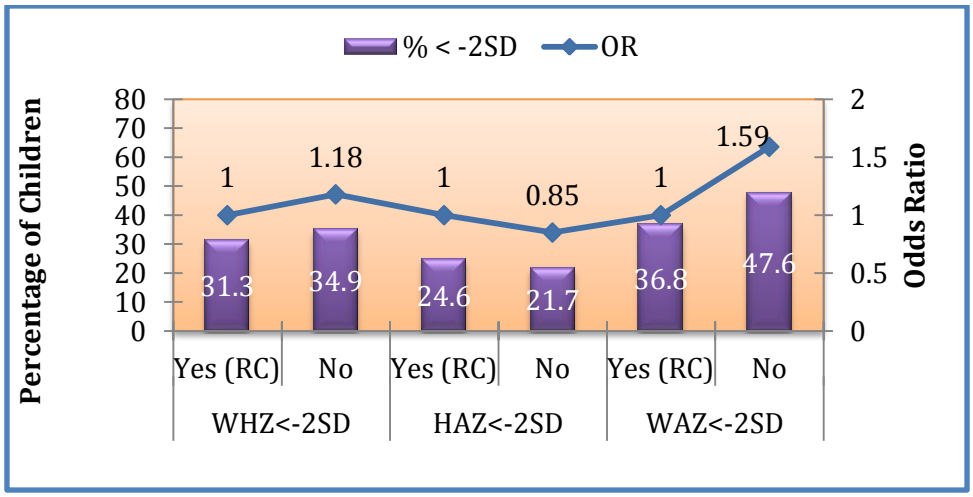
The prevalence and odds of stunting was significantly higher among children belonging to ST (OR 5.71, CI 2.48-13.12, $p<0.001$), OBC (OR 3.66, CI 1.60-8.39, $p<0.01$), not having access household toilets (OR 1.73, CI 1.07-2.78, $p<0.05$), going for defecation in the open (1.84, CI 1.14-2.98, $p<0.05$), born to illiterate mothers (OR 1.64, CI 1.00-2.68, $p<0.05$), male (OR 1.49, CI 1.14-1.96, $p<0.05$), age group of 6-11 months (OR 2.30, CI 1.55-3.66, $p<0.001$), age group of 12-23 months (OR 4.51, CI 3.07-6.63, $p<0.001$), history of cough 15 days preceding the survey (OR 0.64, CI 0.42-0.97, $p<0.05$), GMP done 2 months back (OR 2.23, CI 1.00-4.96, $p<0.05$), GMP done>=3 months back (OR 2.10, CI 1.02-4.20, $p<0.05$) or not attended last *MAMTA DAY* (OR 1.73, CI 1.21-2.48, $p<0.01$).

The prevalence and odds of undernutrition was significantly higher among children belonging to lower SES (OR 1.88, CI 1.22-2.90, $p<0.01$), ST (OR 4.92, CI 2.59-9.45, $p<0.001$), OBC (OR 3.15, CI 1.66-5.98, $p<0.001$), not having access or using household toilet (OR 1.64, CI 1.07-2.51, $p<0.05$), defecation in the open (OR 1.66, CI 1.08-2.55, $p<0.05$), illiterate (OR 2.12, CI 1.32-3.39, $p<0.01$) or LBW (OR 2.83, CI

1.80–4.40, p<0.001).

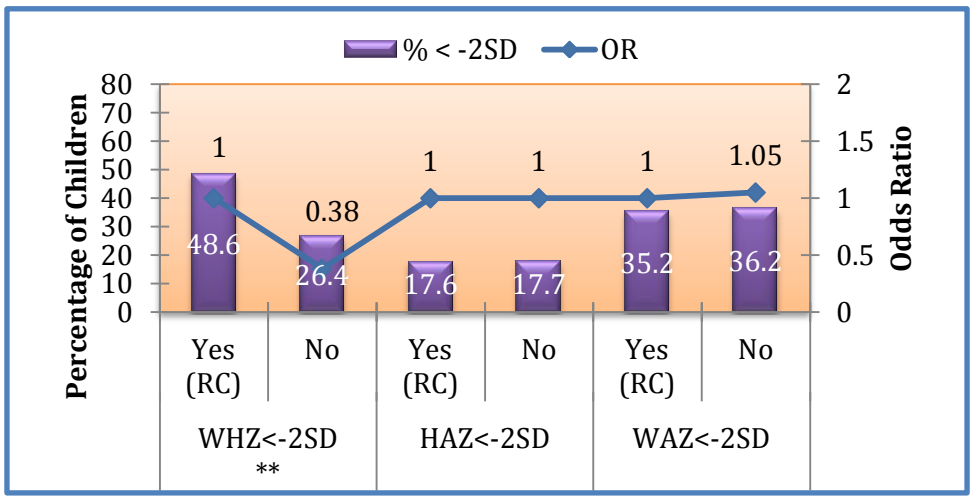
The children who were not initiated on EIBF within 1 hour of birth of birth had comparatively higher prevalence and odds of wasting (OR 1.18, CI 0.69-2.00) and underweight (OR 1.59, CI 0.94-2.58) as compared to children who had EIBF (Figure IV-4). As presented in Figure IV-5, EBF did not show any strong association with undernutrition, whereas the age of introduction of CF between 9-18 months showed a marginally higher prevalence and odds of undernutrition as compared to those who were introduced CF between 6-8 months (Figure IV-6 and Figure IV-7).

Figure IV-4: Association of Early Initiation of Breastfeeding with undernutrition (0-12 months)



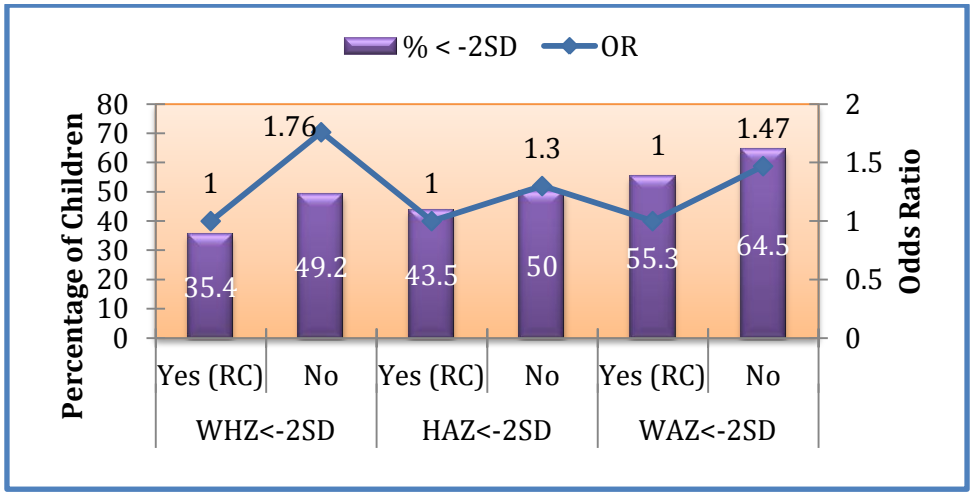
***Note**: RC = Reference Category with OR=1.00*

Figure IV-5: Association of Exclusive Breastfeeding with undernutrition (0-6 months)



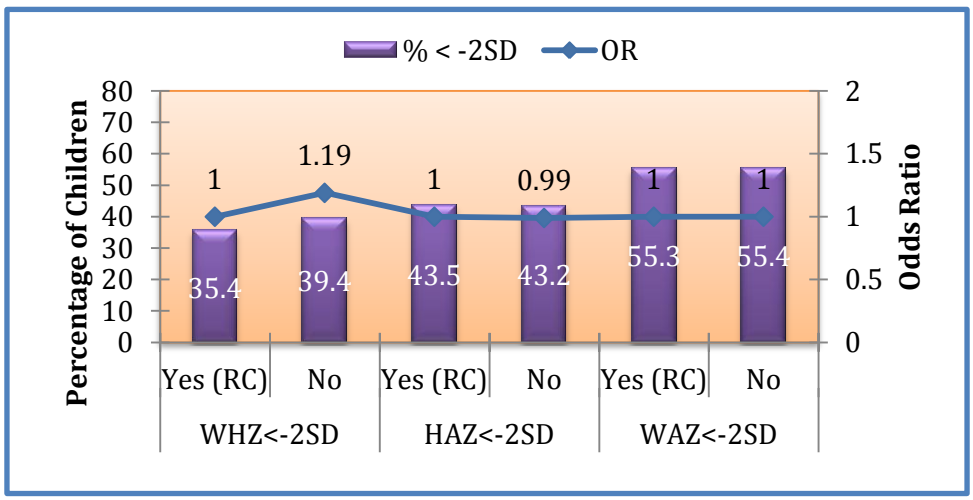
***Note**: RC = Reference Category with OR=1.00; ** Significant at p<0.01*

Figure IV-6: Association of Introduction of Semi-solid Food with undernutrition (6-23 months)



***Note**: RC = Reference Category with OR=1.00*

Figure IV-7: Association of Introduction of Semi-solid Food at 6-8 months with undernutrition (6-23 months)



***Note**: RC = Reference Category with OR=1.00*

Out of the total 26 factors tested in univariate analysis, around 10-11 factors were found to be significantly related with the WAZ, HAZ, WHZ and MUACZ score of the children (Annexure 12).

Multiple regression analysis was done taking the 4 z-scores (WAZ, WHZ, HAZ and MUACZ) as dependent variables, in 3 groups i.e. 1st including children 0-6 mo and EBF as one of the independent variable, 2nd including children 0-12 months and EIBF as one of the independent variable and 3rd including children 6-23 months and initiation of CF from 6th months and *Balbhog* compliance as one of the independent variable.

Of the 26 independent factors assessed, 6 to 8 factors were found to exert an

independent effect at different stages for respective z-scores. Overall, 13/26 factors had independent effect at various stage of which 7 factors entered at 1^{s} place among the 12 regression performed. The highest variation noted was with LBW 23.1% and 15.8% with WAZ and HAZ as dependent variable among children 0-6 months, including EBF as one of the independent variables. Also, LBW was the variable that entered highest number of times (4/12) on the 1st step during the regression, followed by age of child in months (2/12), safety of drawing drinking water from the container (2/12), whereas history of diarrhoea, caste, storage of drinking water and mother's age entered one time each.

To conclude, with reference to three IYCF core indicators, the differences in prevalence of undernutrition were statistically non-significant for all three undernutrition indicators. No association of undernutrition with consumption of *Balbhog* (fortified ready-to-eat food) was noted, among children 6-23 months. The participation of children in monthly GMP showed a positive association with the prevalence of undernutrition.

III. Process Evaluation by Concurrent Assessment

Post capacity building, the process evaluation of field practices related to GMP and IYCF was planned through concurrent assessment for a period of 6 months (November 2009 to April 2010). Overall, 43 IG AWCs visits were made (24 routine days and 19 *MAMTA DAY*s) covering all 19 AWCs, and 35 CG AWCs visits were made (19 routine day and 16 *MAMTA DAY*s) covering all 17 AWCs. The major differences reported between the groups were related to the quality of implementation of services pertaining to IYCF counseling and GMP. The key observations and findings of process evaluations are as follows;

Preparation of Village Micro plan

Post capacity building, village micro plans were available at 66.7% IG-AWC during *MAMTA DAY*, as against 77.8% reported by IG-AWWs, whereas, in CG, except for one AWC (as reported by AWW), the village micro plan was not available in any of the AWCs.

Growth monitoring and Promotion

Weighing of children below 2 years on *MAMTA DAY* in addition to those who came for routine vaccination was observed in 94.4% IG-AWCs, as against 56.3% CG-AWCs.

The actual observations on *MAMTA DAY*, showed, that more children were weighed

in IG (36.8%), as compared to CG (26.0%). Also plotting on *MAMTA* card (23.6% vs. 16.7%) and counseling was noted better in IG (11.1% vs. 5.7%) as compared to CG, which can be attributed to the capacity building.

Status of IYCF Counselling *on MAMTA DAY*

Post capacity building, though, all AWWs reported counseling on IYCF on *MAMTA DAY*, when crosschecked by observations, more AWWs from IG were observed counseling on IYCF (88.9% vs. 37.5%). Also the use of *MAMTA* card for IYCF counselling (55.6% vs. 25%) was better in IG as compared to CG. Similarly, the exit interview of children below 2 years on *MAMTA DAY* also reported better counselling on IYCF in IG (55.6%, n=225) as compared to CG (21.3%, n=150), as well as the use of IYCF guidelines from *MAMTA* card/flip chart/key messages/IEC material (26.6% vs. 20.0%) for counseling on IYCF.

Counselling of Pregnant Women on EIBF

Post capacity building, the counseling of pregnant women on EIBF during *MAMTA DAY*, was reported better by IG-AWWs (88.9%) as compared to CG-AWWs (83.3%). Even though field observations reported less counselling in both groups as compared to that reported by AWWs, the counselling was better among IG-AWWs (26.7%) as compared to CG-AWWs (0%) respectively.

To assess the quality of counseling, the AWWs were assessed on 10 key messages provided during capacity building (Annexure 6), which were to be discussed during the counseling of pregnant women on EIBF. It was noted that only 50% AWWs from IG counseled on EIBF using 10 key messages provided during capacity building, whereas in CG where no such guidelines were issued, even then 57.9% AWWs counsel pregnant women on EIBF, the information shared was not adequate.

Further, the actual observation of pregnant women in the last trimester attending *MAMTA DAY* showed that 37.6% pregnant women attending *MAMTA DAY* in IG were counseled on EIBF (including 18.8% using key messages) as compared to 26.1% pregnant women in CG, which may be attributed to capacity building.

Balbhog Distribution on MAMTA DAY

No major conclusions could be drawn regarding distribution and utilization of *Balbhog* on *MAMTA DAY*, since at the time of evaluation; the availability of *Balbhog* at the AWCs was inconsistent.

However, as a result of capacity building, the distribution of *Balbhog* on *MAMTA DAY*, preferably after GMP, was reported among all IG-AWC as compared to only 36.8% AWCs in CG. Similarly, field observations showed that among the AWCs

where *Balbhog* was available, 21.4% children 6-23 months in IG as compared to only 5.4% in CG were receiving *Balbhog* on *MAMTA DAY*. Also the distribution of *Balbhog* to the children completing 6 months along with counseling about initiation of CF was observed among 83.3% IG children completing 6 months as compared to only 45.5% in CG.

Use of Flip Charts

Post capacity building, the IEC material related to IYCF was available with all IG-AWWs as compared to only 32% among CG-AWWs. The use of IEC material on *MAMTA DAY* and during home visits was better among IG-AWWs (66.7%) as compared to the CG-AWWs (15.7%) and as emphasized during capacity building, the IG-AWWs used the material for all groups of beneficiaries, especially the pregnant and lactating mothers.

Home visits by AWWs

Post capacity building, home visits were conducted in a more planned and effective way by IG as compared to CG AWWs. Both groups mainly covered children below 6 months (IG-36%, CG-50%), pregnant women (IG-36%, CG-25%) and children 6-23 months (IG-28%, CG-15%) during home visits.

Importantly, the IG-AWWs visited households with essential items for recording (such as IMNCI registers), counselling (IYCF flip charts and *MAMTA* card) and distribution (such as *Balbhog*). Also, as a result of capacity building, the IG-AWWs used *MAMTA* card as a counselling and follow-up tool during home visits. They also utilized the opportunity of home visits to advocate and ensured complete and correct use of *Balbhog* with personalized counselling on the same during home visits.

Similar to overall home visits, though, quantitatively home visits of new born were better by CG than IG AWWs, the positive impact of visits on components such as EIBF was observed among all newborns in IG as compared to CG, showing a more focused and organised home visits by IG-AWWs, with good quality inputs, all attributed to the capacity building.

Further, in CG, counseling message regarding EBF till 6 months was predominantly observed being given by AWWs as compared to IG-AWWs who, as a result of capacity building, while counseling on EBF, addressed possible issues which could lead to failure in EBF, ensuring that more mothers who plan to EBF succeed in doing so.

Thus, it can be concluded that, post capacity building, the quality of implementation of services improved among IG-AWWs, as compared to CG-AWWs which could be instrumental in achieving the required behaviour changes in IYCF and GMP.

IV. Impact of Capacity Building of *Anganwadi* Workers on the Knowledge, Perceptions and Practices of the *Anganwadi* Workers and the Supervisors

As a result of capacity building, the overall knowledge score of AWWs in IG improved significantly ($p<0.001$) by 35.3%, whereas in CG, the pre and post knowledge score improved by only 3.6% (Table IV-1). Also, the difference between the knowledge score of IG and CG post intervention was statistically significant ($p<0.001$).

The mean knowledge score of IG-AWWs improved significaly for 15/24 indicators as compared to CG-AWWs, where significant improvement was recorded only for 2/24 indicators. Also, among the CG-AWWs the mean knowledge score significantly reduced with reference to knowledge regarding CF frequency, consistency and quantity. The post capacity building mean knowledge score (including IYCF, GMP and IPC skills) of IG-AWWs was better than CG for 21/24 indicators and significantly better for 11/24 indicators. The major improvement was noted among IG-AWWs regarding addressing mothers' query of "Not Enough Breast Milk', IPC skills, EIBF, type of CF and continuation of breastfeeding till 2 years and beyond along with CF, which were also some of the major issues/challenges identified at baseline.

Among the ICDS Supervisors, post capacity building, the major change in IG-Supervisor was regarding her awareness of the importance of recommended practices. The IG-Supervisor was able to articulate the correct reasons behind adopting these recommended practices, which was the key focus of capacity building, so that these reasons percolated to AWWs, and benefit greatly in IPC with women and their families to bring about the desired impact.

Although the improvement in knowledge of IG-Supervisor was satisfactory in 7/12 areas, further improvement is required for the prevention of undernutrition, which can be achieved by similar on job capacity building. Also, some changes in the work load such as duplicate reporting of data which has already been collected once reduced the participation of supervisors in non-ICDS programs, so as to give the ICDS Supervisors more space to work on the focused area.

Lastly from this entire exercise one more conclusion which may be drawn was that the knowledge and perceptions of field Supervisors depends on their area of priority which may keep changing year after it. A good programming should ensure a holistic approach, ensuring their field staff to be focused on all key areas rather than one parallel intervention, as can be see with the CG-Supervisor who was more focused on "Annaprashan day" and in turn only CF.

Table IV-1: Knowledge and Perception Scores of AWWs

Indicators	Pre (Mean ± SD)		Post (Mean ± SD)		Paired T-test		Independent T-test #	
	IG	CG	IG	CG	IG	CG	Pre	Post
1. Key IYCF Practices	2.53±0.977	2.35±0.843	3.39±0.676	2.79±0.73	-3.049**	-1.694	0.565	2.502*
2. Benefits of Breastfeeding	2.83±1.654	2.24±1.20	4.22±2.34	3.18±2.038	-3.183**	-2.885**	1.218	1.406
3. EIBF	2.28±0.826	2.53±0.717	4.00±1.372	2.65±0.702	-4.562***	-0.489	-0.959	3.639*
4. Colostrum Feeding	2.39±0.608	2.53±0.874	3.22±1.166	3.18±2.651	-3.589**	-0.902	-0.555	0.067
5. EIBF- Caesarean Section	1.00±0.907	1.00±0.866	1.83±0.857	1.35±0.786	-2.832**	-2.073	0.000	1.725
6. Prelacteal feeding	2.28±0.669	2.00±0.612	2.17±0.707	2.12±0.781	0.524	-0.416	1.279	0.195
7. EBF	5.89±1.323	5.41±1.278	8.22±1.592	6.29±1.572	-6.621***	-2.985**	1.084	3.603*
8. Frequency and Duration of BF	1.44±0.856	1.53±0.8	1.94±0.873	1.82±0.728	-1.844	-1.159	-0.303	0.444
9. Not enough milk	0.39±0.608	0.88±0.928	2.72±2.191	0.59±0.939	-4.255***	1.231	-1.872	3.705*
10. Methods of Breastfeeding	4.72±1.638	4.06±1.676	7.44±2.202	4.53±1.586	-3.514**	-1.167	1.184	4.470***
11. Bottle Feeding	1.22±0.732	1.29±0.588	1.89±0.758	1.35±0.702	-2.608*	-0.324	-0.319	2.166*
12. BF during Pregnancy and Illness	4.00±1.609	3.59±1.839	5.28±1.994	3.82±1.741	-3.053**	-0.808	0.706	2.293*
13. BF during Breast problems	2.89±1.079	3.12±1.495	4.06±1.434	3.24±0.903	-2.930**	-0.489	-1.258	2.011
14. Age of Initiation of CF	1.89±0.471	2.12±0.6	2.39±0.698	2.24±0.752	-2.297*	-0.621	0.632	0.627
15. Continuation of BF with CF	1±0.907	0.82±0.728	1.67±1.029	1.12±0.697	-2.287*	-1.319	-0.128	1.837
16. List of CF Items and Reason	7.44±3.072	7.59±3.572	13.28±1.873	7.06±2.331	-5.987**	0.556	0.895	8.726***
17. Freq., Qty and Consistency of CF	5.89±2.494	5.29±1.16	6.33±1.283	3.76±1.348	-0.784	6.260***	0.190	5.776***

Indicators	Pre (Mean ± SD)		Post (Mean ± SD)		Paired T-test		Independent T-test #	
	IG	CG	IG	CG	IG	CG	Pre	Post
18. Feeding during illness	1.83±1.150	1.76±0.97	2.17±1.15	2.29±1.263	-0.766	-1.412	1.514	-0.312
19. Feeding after illness	1.39±0.850	0.94±0.899	1.83±0.924	1.29±0.920	-1.365	-1.102	-0.892	1.730
20. Promote/Encourage CF	6.28±1.320	6.65±1.115	7.22±1.665	6.35±0.996	-1.859	0.651	0.627	1.860
21. Care during feeding	4.06±1.589	3.76±1.091	4.33±1.414	3.71±1.160	-0.772	0.174	1.007	1.430
22. GMP	6.67±1.970	6.12±1.111	7.56±2.093	6.53±2.004	-1.135	-0.876	0.556	1.480
23. Diet during Preg. and Lactation	7±2.722	6.59±1.417	7.44±2.175	5.94±2.045	-0.634	1.165	1.322	2.103*
24. IPC skills	0.50±0.707	0.24±0.437	1.61±1.092	0.47±0.514	-3.986***	-1.725	0.565	3.913***
Total Score	**73.14±8.568**	**69.35±9.729**	**99.00±14.058**	**71.85±9.950**	**-9.133*** **	**-1.337**	**1.224**	**6.558*** **

**p<0.05, **p<0.01, ***p<0.001, all others statistically non-significant # Equal variation assumed*

V. Impact of capacity building on undernutrition prevalence, and associated infant and young child practices of the care providers of the children under two years

A. Infant and Young Child Feeding Practices

Breastfeeding

Status of Breastfeeding Practices

In both the groups breastfeeding was universal (99-100%) pre and post intervention. The capacity building showed a significant improvement in EIBF (↑35.6% vs. ↑6.9%, p<0.001), EBF (↑50% vs. ↓16.4%, p<0.001) and age appropriate breastfeeding rates (↑16.7% Vs ↑12.5%, p<0.05) in IG as compared to CG, where the changes were statistically non-significant (Table IV-2). Improvement was observed in all 9 breastfeeding indicators in IG (Avg. ↑32.9%, excluding bottle feeding) as compared to 6 indicators in CG (Avg. ↑1.9%, excluding bottle feeding) respectively. Also, the bottle feeding rates dropped in IG by 39.1% (8.7% to 5.3%) as compared to a nominal drop in CG by 2.4% (8.3% to 8.1%).

Table IV-2: Impact of Capacity Building on Breastfeeding Indicators

BF Indicators (WHO 2008)	IG			CG		
	Pre	Post	$\chi 2$	Pre	Post	$\chi 2$
EIBF (Normal delivery)	65.4 (100/153)	88.7 (157/177)	24.61***	80.8 (135/167)	86.4 (133/154)	1.39 NS
EIBF (C-section Delivery)	47.4 (9/19)	56.3 (9/15)	0.15 NS	33.3 (4/12)	44.4 (8/18)	0.05 NS
EBF	25.2 (27/107)	64.0 (73/114)	31.9***	37.8 (45/119)	31.6 (30/95)	0.65 NS
BF till 1 yr	85.3 (29/34)	95.1 (39/41)	1.12 NS	93.3 (28/30)	82.8 (24/29)	0.73 NS
Ever BF	98.3 (173/176)	100 (193/193)	1.54 ns	99.4 (180/181)	100 (172/172)	0.00 NS
BF till 2 yr	67.6 (25/37)	75.9 (22/29)	0.22 NS	67.6 (23/34)	62.8 (27/43)	0.04 NS
Age appropriate BF (0-23 mo.)	53.4 (140/262)	62.3 (165/265)	3.86*	62.3 (165/265)	70.1 (185/264)	3.26 NS
• <6 mo. (EBF)	25.2 (27/107)	37.8 (45/119)		64 (73/114)	31.6 (30/95)	
• 6 to 23 mo. (BF+CF)	72.9 (113/155)	82.2 (120/146)		85.8 (145/169)	91.7 (155/169)	
Predominant BF U-6 mo.	83.2 (89/107)	89.5 (102/114)	1.37 NS	84.9 (101/119)	82.1 (78/95)	0.13 NS
Duration of BF	9.20±6.68	9.01±6.47		8.65±6.80	8.98±6.60	
Bottle feeding	5.1 (9/177)	4.7 (9/193)	1.00 NS	6.1 (11/181)	7.6 (13/172)	0.15 NS

** Significant at p<0.05* *** Significant at p<0.01* **** Significant at p<0.001*

Knowledge and Perceptions on Breast Feeding Practices

In the current study, the pre and post knowledge score of IG pregnant women improved significantly for all 3 early breastfeeding practices. The improvement in knowledge related to EIBF, colostrum feeding and prelacteals feeding was 35.7% (67.1 vs. 31.3%), 21.3% (63.9% vs. 42.6%) and 0.6 times (1.3 times vs. 0.7 times) better in IG as compared to, CG respectively.

Further, although the knowledge about EBF improved in both groups, among pregnant and lactating women, the improvement was more significant for IG lactating mothers ($p<0.001$) as compared to CG ($p<0.01$). Among pregnant women, significant improvement was only in CG ($p<0.01$). On the other hand, the knowledge regarding duration of breastfeeding with CF improved only among IG pregnant and CG lactating mothers.

The appropriate response related to breastfeeding frequency, duration and adequacy improved in IG pregnant and lactating women by 4.1% (12.9% vs. 8.8%) and 10.5% 13% vs. 2.5%) more than CG. The mean feeding frequency recommended by pregnant women improved more among IG (8.98±3.76 to 9.59±3.42) as compared to CG (9.67±3.70 to 9.72±4.37).

Post intervention, the knowledge of pregnant women regarding benefits of breastfeeding was better in IG as compared to CG, whereas among lactating women, although the knowledge of IG women improved, as compared to baseline, the overall score remained better for CG. Finally, the knowledge score regarding breastfeeding and mother's health, improved better in IG by 17% (32.4% vs. 15.4%).

Overall, it can be concluded that the impact of capacity building was mainly noted with reference to IG mother's knowledge regarding key breastfeeding practices like early breastfeeding practice (EIBF, colostrum feeding, no prelacteal feeding), EBF and continued breastfeeding till 2 years and beyond.

Further, the translation of mothers' knowledge into practice was better noted among IG mothers, as compared to CG, as observed in further results. This may be attributed to the quality of messages and support provided by IG AWWs during counseling as against IG, as a result of the capacity building.

Complementary Feeding

Status of Complementary Feeding Practices

Among the CF indicators, the initiation of CF between 6-8 months and minimum meal frequency (MMF) improved significantly ($p<0.05$) in IG as compared to no such impact in CG. Regarding the Minimum Dietary Diversity (MDD), although marginal

decline in both the groups. the mean MDD value improved in IG compared to, mariginal reduction in CG. Similarly, the key CF indicator Minimum Acceptable Diet showed a marginal decline in CG, as compared to no change in IG.(Table IV-3).

The baseline assessment showed that among all iron rich foods the major source was ICDS fortified *Balbhog* (84.7% i.e. 32.7% out of 38.6%). Thus during the post capacity building survey due to supply issues related to *Balbhog*, there was a significant reduction ($p<0.001$) in the consumption of iron-rich food in both the groups. Also, there was a decline in Milk Feeding Frequency of non-breastfed children; this was mainly as a result of reduction in non-breastfed children in IG from 11.8% (18/153) to 7.2% (13/180), whereas in CG it increased from 12.9% (21/163) to 17.5% (30/171).

Table IV-3: Impact of Capacity Building on Complementary Feeding Indicators

CF Indicators (WHO 2008)	IG			CG		
	Pre	Post	$\chi 2$	Pre	Post	$\chi 2$
Complementary feeding at 6-8 mo.	50 (18/36)	75 (33/44)	4.33*	86.2 (25/29)	67.4 (29/43)	0.24 NS
Min Diet diversity # (MDD)	23.6 (42/178)	22.1 (42/190)	0.05 NS	27.4 (46/168)	25.4 (49/183)	0.00 NS
Min Meal Frequency (MMF)	51.0 (78/153)	63.9 (115/180)	5.14*	60.1 (98/163)	64.9 (111/171)	0.63 NS
Min Acceptable Diet	15.0 (23/153)	15.0 (27/180)	0.02 NS	16.6 (27/163)	13.5 (23/171)	0.41 NS
Consumption of Iron Rich food	30.9 (55/178)	11.1 (21/190)	20.89***	41.7 (70/168)	24.6 (45/183)	10.83***
Milk Freq. for Non-breastfed	66.7 (12/18)	53.8 (7/13)	0.12 NS	76.2 (16/21)	80 (24/30).	0.00 NS

; Corrected x^2 used

** Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001*

Knowledge and Perception of Complementary Feeding Practices

The knowledge of mothers of children below 1 year from both groups showed improvement regarding three aspects of complementary feeding with reference to the age of introduction of CF i.e. age of introduction of top milk, introduction of solid and semi-solid foods and introduction of food from family pot or meal. Also, the improvement was statistically significant among IG regarding introduction of top milk ($p<0.01$) and introduction of food from family pot ($p<0.05$) and among CG, regarding age of introduction of CF ($p<0.01$) and food from family pot ($p<0.01$). There was a significant ($p<0.01$, t-value-2.612) shift in the knowledge regarding the mean age of

introduction of top milk in IG from 9.56±9.18 to 6.57±4.90.

The knowledge and perceptions of mothers (below 6 mo.) about the consistency of CF improved in IG with more mothers recommending medium (53%) to thick (67.4%) consistency of CF, whereas in CG, mothers recommending thin liquid type CF increased by 1.4 times.

Further, the knowledge of mothers on optimal feeding frequency (one bowl 3 times a day) of children (7-11 mo.) also improved in IG by 8% more (IG ↑23.7% vs. ↑15.7% CG), as compared to CG; whereas, among older children (12-23 mo., 1½ bowl 5 times daily), the knowledge of CG mothers' remained better.

With reference to feeding during and after illness, the knowledge and perceptions of mothers of children below 2 years, regarding feeding the child with increased number of meals/quantity of food while recovering from illness improved by 74.2% in IG, and 96.9% ($p<0.001$) in CG. Also, breastfeeding during diarrhea improved in IG by 5.1%, whereas in CG there was a decline by 6.3%. Among those having diarrhea, however, the differences were not statistically significant.

Post capacity building, more mothers (below 1 year) from IG (↑23.1%, 7.6 % and 2 times $p<0.01$) as compared to CG (↓36.5% $p<0.01$, 3.6% and 1.7 times $p<0.05$), showed improved knowledge regarding responsive feeding behaviour. As more mothers from IG believed that a child can eat by himself/herself around 2-3 years (↑23% vs. ↓32.6%), it is important to sit and monitor the child while eating (↑7.6% vs. ↑3.6 %) and mothers should encourage and feed the child, when the child refuses to complete the given food (↑2 times $p<0.01$ vs. ↑1.7 times $p<0.05$).

The knowledge of mothers (6-23 mo.) regarding hand-washing with soap and water before complementary feeding improved significantly ($p<0.001$) in both groups, but the improvement was better in IG by 87% as compared to 78% improvement in CG.

IYCF Practices

As presented in Figure IV-8 to Figure IV-11, overall age-wise trend analysis of infant feeding practices showed that compared to baseline, in IG there was a decline in the use of plain water ($p<0.01$) and other milk before 6 months and a concomitant increase in EBF rates, whereas in CG the age-wise trends in infant feeding practices continued to remain similar to baseline, in fact there was a marginal increase in the use of prelacteals, plain water and other milk items.

To conclude, as presented in Figure IV-12, the IYCF core and optional indicators improved in IG by 34.7% and 7.2% respectively as a result of capacity building, whereas in CG a reduction of around 6.4% was noted.

Figure IV-8: Infant and Young Child Feeding Practices by Age (%) - IG Pre

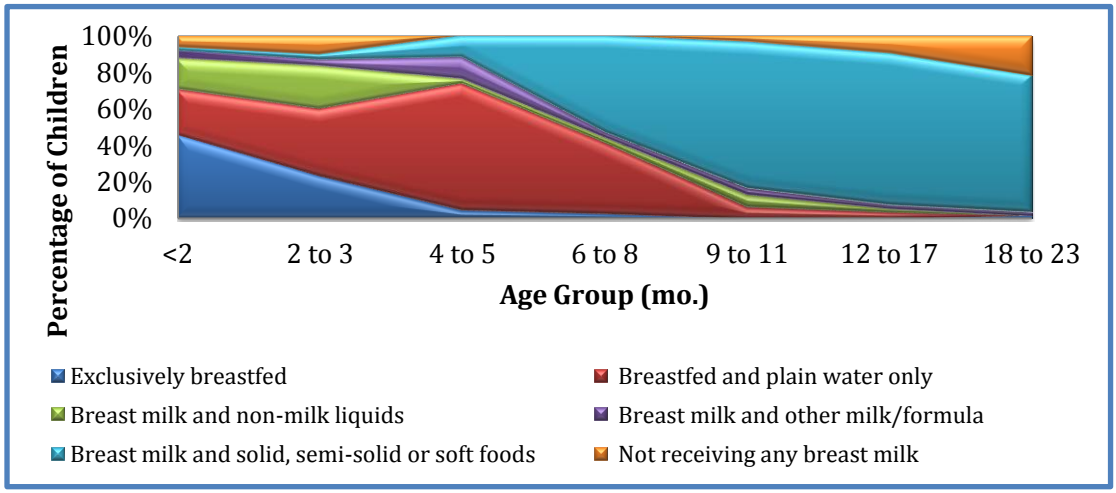


Figure IV-9: Infant and Young Child Feeding Practices by Age (%) - IG Post

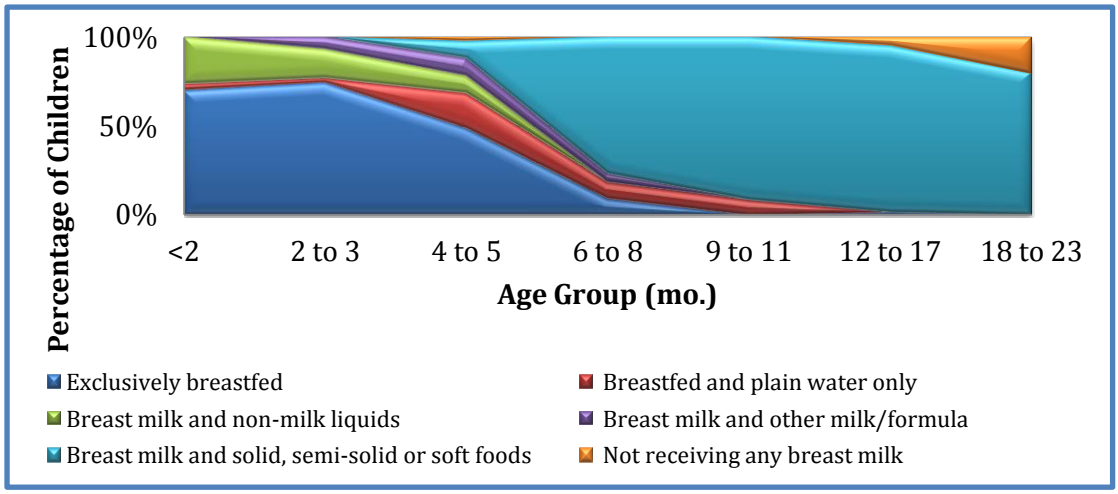


Figure IV-10: Infant and Young Child Feeding Practices by Age (%) - CG Pre

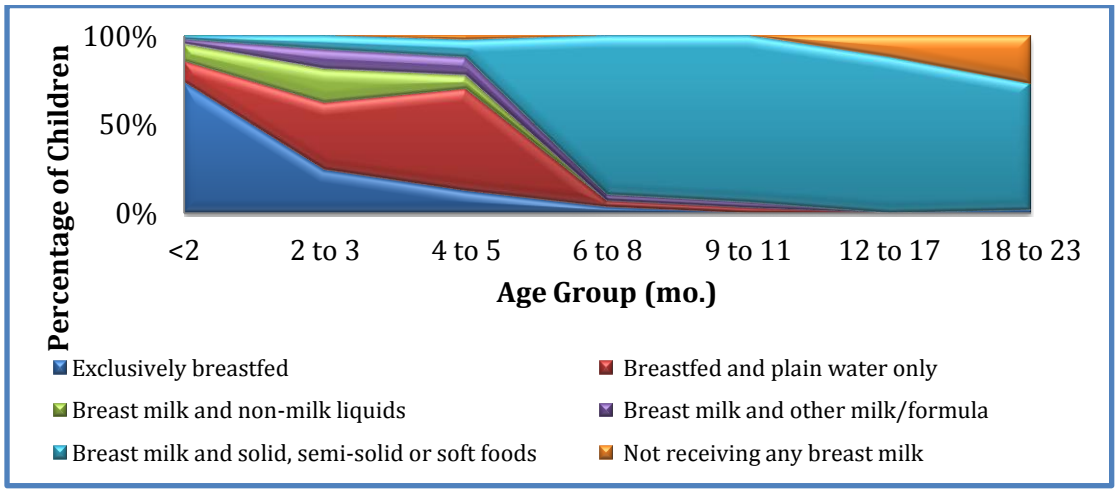


Figure IV-11: Infant and Young Child Feeding Practices by Age (%) - CG Post

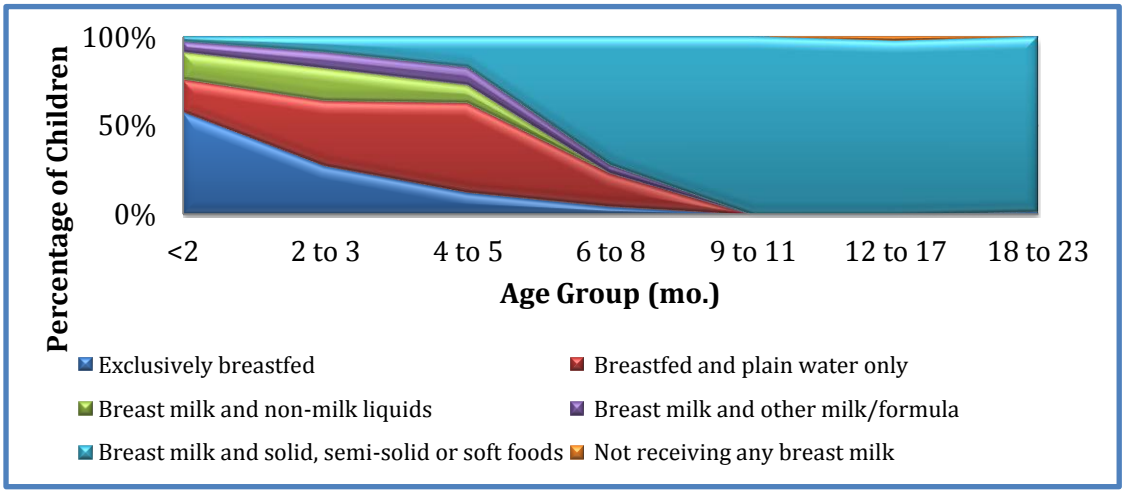
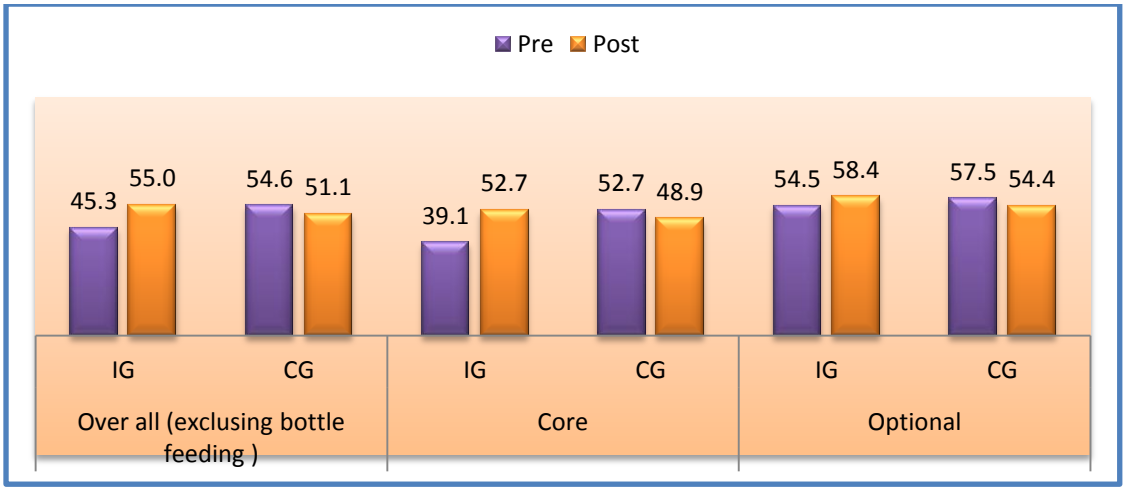


Figure IV-12: IYCF Indicators Average Score



B. Utilization of Integrated Child Development Services for Children under Two Years

Growth Monitoring and Promotion

Post capacity building although the improvement in knowledge of mothers about GMP was marginally better in IG as compared to CG, the overall status of GMP was significantly better in IG. Significant improvement was observed in IG, related to the important activities of GMP, such as recent weighing in last 30 days (↑21%, $p<0.01$), plotting on *MAMTA* card after GMP (↑4.3 times, $p<0.001$), mother's awareness about child's nutritional status, weight, nutritional grade and colour ($p<0.001$,↑5, ↑2.6, ↑5.1 and ↑11.3 times) as compared to non-significant changes in CG, except about the mother's awareness of child's nutritional status ($p<0.001$, ↑2.2 times).

The overall weighing of children, other than those who came for immunization/health

checkup, also increased by 5.5% in IG as compared to reduction in CG by 5.9%, and the difference between the two groups (73.7% vs. 63.8%) was statistically significant p<0.001.

Village Health and Nutrition Day (*MAMTA DAY*)

Post capacity building, the awareness of *MAMTA DAY* and its schedule increased by 70% and 55% more in IG as compared to CG. Importantly, the participation of mothers on the *MAMTA DAY* (preceding the survey) improved by 17.7% in IG as compared to reduction in CG by 1.2%.

The overall counseling by AWWs using *MAMTA* card, as well as counseling by AWWs on key IYCF and GMP messages using *MAMTA* card which is essential to ensure that consistent and precise messages are given to mothers and care givers, improved significantly (p<0.001) in IG by 7 to 7.5 times whereas among the CG-AWWs the improvement was only 1.2 times (Table IV-4).

Also, post capacity building mothers' understanding of growth chart and IYCF guidelines on *MAMTA* card improved by 7.6 (p<0.001) and 3.5 (p<0.001) times in IG as compared to 1.8 (p<0.001) and 1.4 times in CG respectively

Table IV-4: Change in Status of Counseling on Key Messages / Services after Capacity Building Intervention

Percent Beneficiary Counseled	Pre		Post	
	IG (N=285)	CG (N=286)	IG (N=304)	CG (N=279)
Child Care Component of MATMA Card				
Explained	24 (69)	36.7 (105)	60.2 (183)	38.1 (106)
Explained by AWW	5.6 (16)	12.6 (36)	42.4 (129)	14.7 (41)
Counseling by AWWs on MATMA card growth chart				
Growth chart, color	-	0.7 (2)	29.9 (91)	11.9 (33)
Growth chart, grade	-	-	1.0 (3)	-
Growth chart, change in weight/grade	-	0.4 (1)	3.6 (11)	-
Growth chart, curve	-	-	-	0.4 (1)
Mother's Understanding of MAMTA Card				
Growth chart - colors	5.6 (16)	18.9 (54)	44.1 (134)	31.7 (88)
Growth chart - grades	1.4 (4)	1.4 (4)	2.3 (7)	1.4 (4)
Growth chart - curves	3.5 (10)	10.8 (31)	33.6 (102)	23.7 (66)
IYCF message	9.4 (27)	15.4 (44)	33.2 (101)	21.9 (61)

Note: Statistically significant *(p<0.001) improvement in IG - mothers' understanding of IYCF messages and growth chart colour and curves of IG and CG-mothers*

Awareness and Utilization of *Balbhog* Supplementation

The major impact of capacity building was regarding distribution of *Balbhog* on

MAMTA DAY, which increased significantly (p<0.001) among IG children (6-23 mo.) by 4.6 times as compared to only 1.2 times increase in CG.

Due to reduction in supply of *Balbhog*, no major conclusion could be drawn regarding frequency and household utilization of *Balbhog* in IG and CG, respectively. Also, the type and number of recipes prepared from *Balbhog* remained similar to baseline in both the groups.

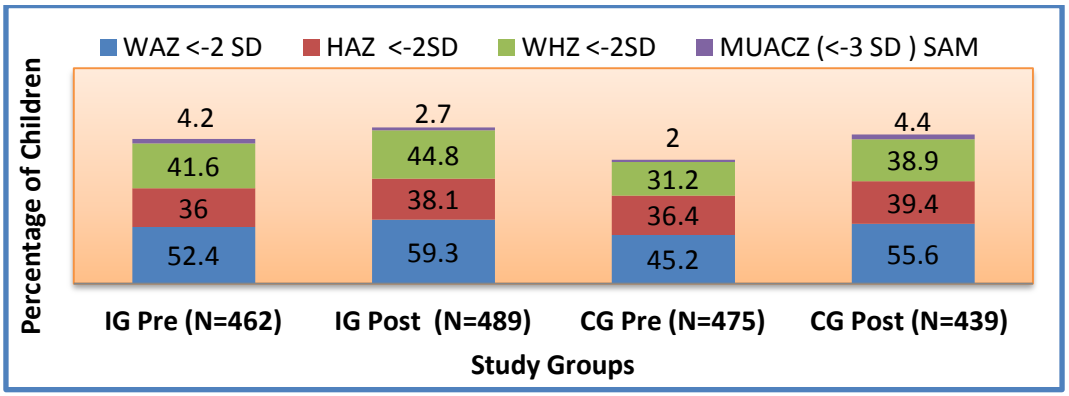
However, despite supply issue, the statistically significant reduction in end use and utilization of *Balbhog* among children (6-23 mo.) was lower in IG by 4.6% (IG ↓22.1 vs. CG ↓26.7%) and 4.8% (IG↓0.3 vs. CG↓5.1) as compared to, CG, which may be attributable to capacity building. Also, the perceived benefits of *Balbhog* for children improved significantly in IG (26.8%, p<0.05) and CG (28.6%, p<0.01) respectively.

C. Nutritional Status of the Children under Two Years

Change in Prevalence of Undernutrition

Post capacity building, the prevalence of undernutrition increased across all indices in CG by 8.2% (stunting) to 56.5% (MUACZ <-2SD) as compared to the IG by -10.1% (MUACZ <-2SD) to 13.2% (underweight). The increase in the prevalence of undernutrition (underweight, wasting and MUACZ<-2SD) and reduction in the respective mean z-score was statistically significant for CG as compared to a significant increase only in the prevalence of underweight in IG. The impact of capacity building was mainly observed on the prevalence of SAM (MUACZ <-3SD), with 1.6 times (4.2% to 2.7%) reduction in the prevalence of SAM in IG, as against 2.2 times (2% to 4.4%) increase in prevalence of SAM in CG (Figure IV-13). Furthermore, post capacity building, the prevalence of severe stunting reduced in IG by 6.5%, whereas the prevalence increased in CG by 9.7%. Finally, the risk ratio (RR) estimates showed that IG had 9%(1.15 vs. 1.24), 3% (1.04 vs. 1.07) and 13% (1.06 vs. 1.19) less risk of developing underweight, stunting and wasting, as compared to CG and the risk difference (RD) analysis showed that IG had 3.4% (6.92 vs. 10.32), 0.89% (2.11 vs. 3.00), 4.51% (3.18 vs. 7.69) and 3.71% (-1.29 vs. 2.42) less underweight, stunted, and wasted and SAM children as compared to CG. Also, a protective effect of capacity building on the prevalence of SAM was observed in IG with RR<1, as against a 41% risk of developing SAM among CG. Thus, it can be concluded that the risk of developing undernutrition and undernourished children including SAM was lower in IG as compared to CG. This impact may be as a result of capacity building, resulting into improved feeding practices and less undernutrition.

Figure IV-13: Impact of Capacity Building on Undernutrition



Statistically significant reduction in prevalence of underweight (CG p<0.01, IG p<0.05), wasting (CG p<0.05) and MUACZ<-2SD (CG p<0.05)

Sex-wise Impact of Capacity Building

Sex-wise, except for stunting (non-significant increase), undernutrition increased significantly with regard to all the anthropometric indices among CG males as compared to less and non-significant increase among IG males. The prevalence of severe stunting (HAZ<-3SD) and SAM (MUACZ<-3SD) reduced among IG males post capacity building, whereas no such reduction was noted among CG males. The risk estimates showed a protective effect of capacity building on IG males with SAM (MUACZ <-3SD), whereas no such effect was seen among the CG males.

Post capacity building, the mean WHZ and MUACZ score reduced significantly within CG females as compared to non-significant reduction in IG. More importantly, severe underweight, wasting and SAM (MUAC<-3SD) reduced among IG females, as contrast to an increase in prevalence among CG females. The risk ratio estimates showed a protective effect of capacity building on SAM within IG females, whereas no such effect was seen among CG females.

Age-wise Impact of Capacity Building

Age-wise, among children 0-5 months, the protective impact of capacity building was only observed on the prevalence of severe wasting among the IG.

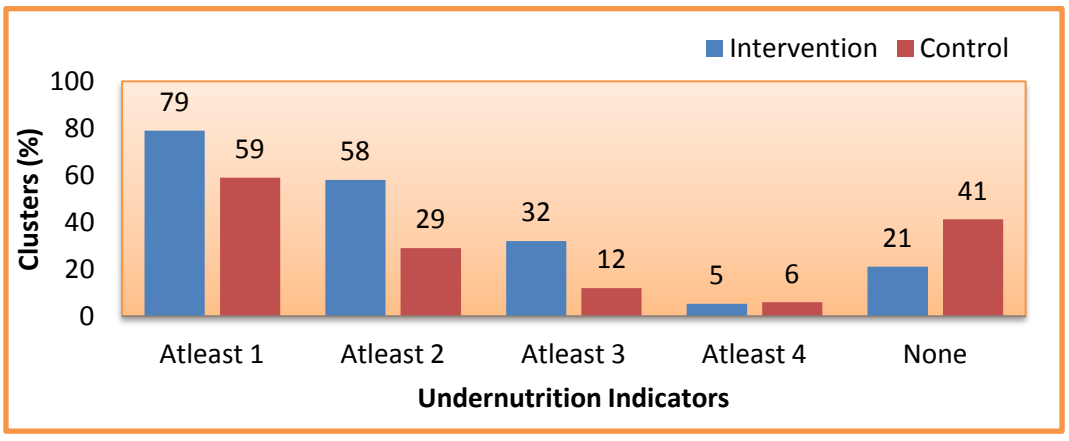
Among the children 6-11 months, the prevalence of wasting and MUAC<-2SD increased significantly among CG, contrary to the reduction in the prevalence of MUACZ<-2SD in IG. The mean WAZ, WHZ and MUACZ score reduced significantly within CG as compared to the IG. Except for the prevalence of stunting, the risk difference estimates showed a less undernutrition post capacity building among IG as compared to CG children in the same age group (6-11 mo.). Thus, lower undernutrition in IG children 6-11 months as compared to CG may be as a result of improved counselling on IYCF by AWWs, and the capacity building of AWWs,

resulting into improved complementary feeding practices in the study population and better nutritional status of children 6-11 months. The impact of capacity building, among the children in the age group of 12-23 months, was seen mainly on the MUACZ scores. Not only was there a reduction in the prevalence of MUACZ<-2SD and SAM (MUACZ<-3SD), but the mean MUACZ values also increased significantly among IG. Overall, the risk difference analysis showed a less risk of undernutrition among IG, as compared to CG children 12-23 months. The RR estimates showed a protective effect of capacity building on stunting and SAM in the IG (RR<0) as compared to a 12% and 24% increase risk of stunting and SAM among CG.

Cluster-wise Impact of Capacity Building

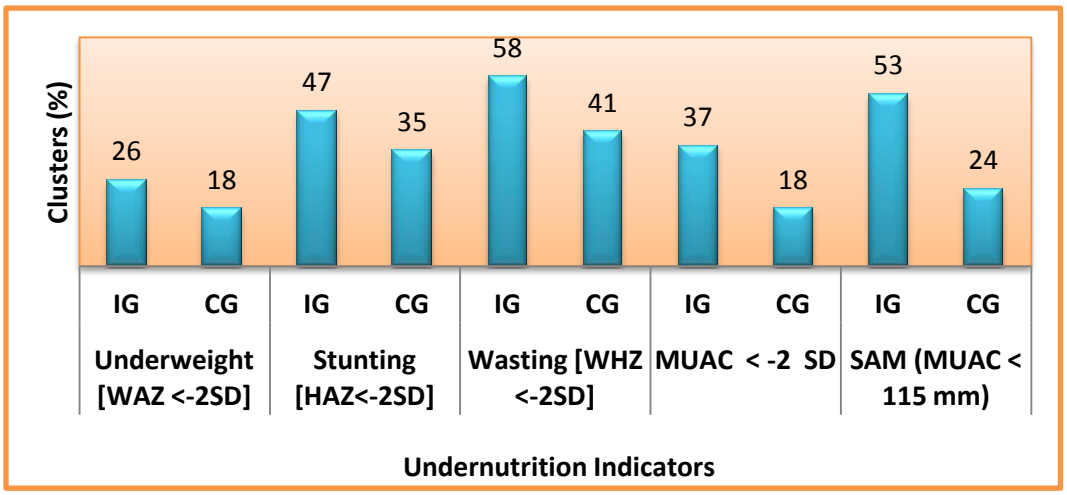
Cluster-wise, as presented in Figure IV-14, a total of 20% more clusters showed a protective effect of capacity building on at least one indicator of undernutrition among IG (79%, 15/19) as compared to CG (59%, 10/17). Almost double the number of clusters (29% more) showed a protective effect of capacity building on at least two indicators of undernutrition in IG (58%, 11/19) as compared to CG (29%, 5/17). Among the clusters showing protective effect of capacity building on at least three of four indicators of undernutrition, IG (32%, 6/19) had 20% more clusters as compared to CG (12%, 2/17). Overall, both the groups had one cluster each showing a protective effect on undernutrition on all four indicators.

Figure IV-14: Percent Clusters Showing Protective Effect of Capacity Building



Post capacity building, the IG's had more percent clusters showing improvement in nutritional indices. Among all indices, the major difference between the IG and CG was in cluster-wise prevalence of SAM (MUACZ<-3SD, 29%) and MUACZ<-2SD (18%), followed by wasting (17%), stunting (12%) and least difference was with reference to clusters improvement in underweight by 8% (Figure IV-15).

Figure IV-15: Percent Clusters Showing Improvement in the Level of Undernutrition – Post Capacity Building



Note: *Based on RR estimates*

Change in Prevalence of Undernutrition – Paired Cohort

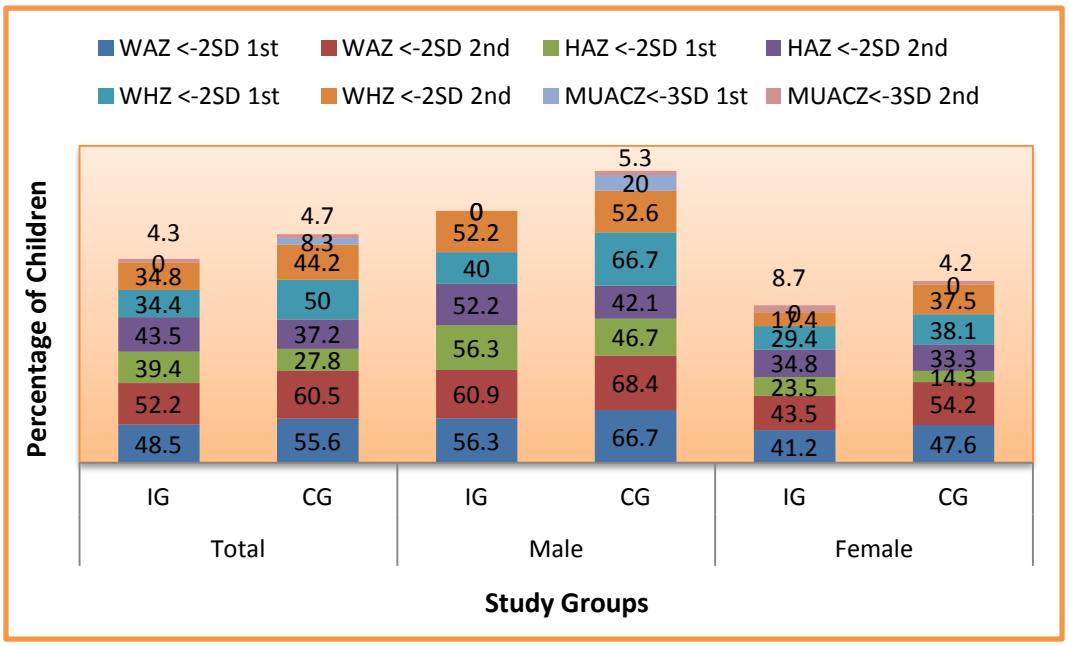
As the age of the paired cohort increased, the prevalence of undernutrition increased in both the groups. However, as a result of the capacity building of IG-AWWs, resulting into improved counselling and feeding practices of mothers related to IYCF, the increase in prevalence of wasting (↑38.8% vs. ↑60.4%) and MUACZ<-2SD (4 times vs. 1.8 times) was comparatively lower in IG as compared to CG paired cohort.

Change in Prevalence of Undernutrition – In Pregnant Women Cohort

The mean age of children during the 1st and 2nd follow-up was around 8.5 months and 13 months in both the groups respectively. Post capacity building, during both the follow-ups, the prevalence of underweight (7.1% to 8.3%), wasting (15.6% to 9.4%) and SAM (8.3% to 0.4%) was more among CG as compared to IG (Figure IV-16). Between the two follow-ups, the difference in prevalence between IG and CG increased with regard to underweight, whereas the difference between two groups reduced with reference to other three parameters.

The prevalence of underweight, wasting and SAM was less among IG males and females (except for SAM 2nd follow-up in females) as compared to CG.

Figure IV-16: Prevalence of Undernutrition – In Pregnant Women Cohort during 1st and 2nd Follow-up



VI. Conclusions

In the current study, the two major issues identified behind failure in adaptation of optimal IYCF practices were:

- The incomplete knowledge and perceptions of ICDS workers in understanding optimal IYCF practices and importance of GMP.
- Lack of IPC skills and practices of the workers, resulting in their inability to understand issue faced by the community and addressing them effectively.

As a result of all these, the knowledge, attitude and practices of mothers of children below 2 years on IYCF practices and GMP were poor, contributing to a higher prevalence of undernutrition among children below two years.

The AWWs failed to understand and address the reasons, issues and challenges faced by the community while making an attempt to follow optimal IYCF practices. The capacity building of the functionaries dealt with these issues, resulting into improvement in community based IYCF practices, as well as the prevention of undernutrition and reduction of SAM in the community.

The major conclusions that can be drawn from the current study are:

- ICDS AWWs and Supervisors, have the fullest potential to bring about the required behaviour change in the community, in their limited capacity and time. What is required is to provide them with the state-of-art guidelines and realistic

doable duties, dealing with their existing constrains and problems.

- Long term, sustained capacity building of AWWs with continued hand-holding and monitoring and assessment of the existing issues, behind failure in adaptation of a particular behaviour could bring about the required behaviour change related to optimal IYCF practices and eventually prevention of undernutrition.

Limitations

Although designed as an operational research, where in the role of researcher was limited to the capacity building of AWWs, followed by project implementation through the existing system (ICDS Supervisors and AWWs), the association of ICDS Supervisors, and AWWs with the researcher could have affected the motivation and performance, in both intervention and control area.

Also, the researcher believes that the true impact of the intervention has the potential to be more than what was obtained, since many constraints, such as prolonged monsoon, problems in supply of SNP and problems in health services (immunization) also could have had an impact on the nutritional status of the children.

Future Score of Investigation

The study recommends planned operational research studies with longer duration, so as to systematically review the existing and upcoming public health nutrition interventions, and continued assessment of the actual impact of such interventions on field. The operational research with continued systematic evaluation/assessment would not only help in identifying the limitations of interventions, but also bring to the forefront the areas for improvement in existing program, so as to bring about faster and quicker results.

BIBLIOGRAPHY

ACC/SCN. (1990a).

Appropriate Uses of Anthropometric Indices in Children. ACC/SCN State-of-the-Art Series, Nutrition Policy Discussion Paper No.7. ACC/SCN, Geneva.

ACC/SCN. (2000).

Fourth Report on the World Nutrition Situation. Geneva: ACC/SCN in collaboration with the International Food Policy Research Institute.

AED. (1999).

Recommended Feeding and Dietary Practices to Improve Infant and Maternal Nutrition. 1825 Connecticut Avenue NW Washington, DC: The Linkage Project.

AED. (2007).

Working Group on Infant and Young Child Feeding Indicators. Developing and validating simple indicators of dietary quality of infants and young children in developing countries: Additional analysis of 10 data sets. Report submitted to: the Food and Nutrition Technical Assistance (FANTA) Project/Academy for Educational Development (AED), July 2007.

Aggarwal, A., Arora, S., and Patwari, A. K. (1998).

Breastfeeding among urban women of low-socioeconomic status: factors influencing introduction of supplemental feeds before four months of age. Indian pediatrics, 35(3), 269.

Aggarwal, A., Verma, S., and Faridi, M. M. A. (2008).

Complementary feeding—reasons for inappropriateness in timing, quantity and consistency. The Indian Journal of Pediatrics, 75(1), 49-53.

Aidam, B. A., Pérez-Escamilla, R., and Lartey, A. (2005).

Lactation counseling increases exclusive breast-feeding rates in Ghana. The Journal of nutrition, 135(7), 1691-1695

Albernaz, E., Giugliani, E. R., and Victora, C. G. (1998).

Supporting breastfeeding: a successful experience. Journal of Human Lactation, 14(4), 283-285.

Alderman, M. H., Wise, P. H., Ferguson, R. P., Laverde, H. T., and D'Souza, A. J. (1978).

Reduction of young child malnutrition and mortality in rural Jamaica. The Journal of tropical pediatrics and environmental child health, 24(1), 7.

Ali, N. S., Azam, S. I., and Noor, R. (2003).

Women's beliefs regarding food restrictions during common childhood illnesses: a hospital based study. J Ayub Med Coll Abbottabad, 15(1), 26-28.

Ali, S., Ali, S. F., Imam, A. M., Ayub, S., and Billoo, A. G. (2011).

Perception and practices of breastfeeding of infants 0-6 months in an urban and a semi-urban community in Pakistan: a cross-sectional study. Journal of the Pakistan Medical Association, 61(1), 99.

Allen, L. H., and Ahluwalia, N. (1997).

Improving iron status through diet: The application of knowledge concerning dietary iron bioavailability in human populations.

American Academy of Pediatrics. (1998)

Pediatric Nutrition Handbook. Elk Grove Village, Illinois: American Academy of Pediatrics, 1998.

Aniansson, G., Alm, B., Andersson, B., Hakansson, A., Larsson, P., Nylen, O., Peterson, H., Rignér, P., Svanborg, M., Sabharwal, H., and Svanborg, C. (1994).

A prospective cohort study on breast-feeding and otitis media in Swedish infants. The Pediatric infectious disease journal, 13(3), 183-187.

Arachavsky, I., A. (1952).

Immediate breastfeeding of newborn infant in the prophylaxis of the so called physiological loss of weight. Vopr Pediatric 1952, 20:45 Abstract in Courier 153, 3:170.

Arentoft, B., and Jensen, L. K. (1983).

The effect of hospital routine on the frequency and duration of Breastfeeding. Significance of an early start of Breastfeeding, use of food supplements, weight control and night feeding]. Ugeskrift for laeger, 145(32), 2462.

Aruldas, K., Khan, M. E., and Hazra, A. (2010).

Increasing early and exclusive breastfeeding in rural Uttar Pradesh. Journal of family welfare, 56.

Ashworth, A., Feachem, R., G. (1986).

Interventions for the control of diarrhoeal diseases among young children: growth monitoring programmes. Document CDD/86. Geneva : World Health Organization, 1986.

Ashworth, A., Shrimpton, R., and Jamil, K. (2008).

Growth monitoring and promotion: review of evidence of impact. Maternal and child nutrition, 4(s1), 86-117.

Avsm, Y. S., Gandhi, N., Tandon, B. N., and Krishnamurthy, K. S. (1995).

Integrated child development services scheme and nutritional status of Indian children. Journal of tropical pediatrics, 41(2), 123-128.

Bajpai, N., and Dholakia, R. H. (2011).

Improving the Integration of Health and Nutrition Sectors in India.

Baker, E. J., Sanei, L. C., and Franklin, N. (2006).

Early initiation of and exclusive breastfeeding in large-scale community-based programmes in Bolivia and Madagascar. *Journal of health, population, and nutrition*, *24*(4), 530.

Banapurmath, C. R., Nagaraj, M. C., Banapurmath, S., and Kesaree, N. (1996).

Breastfeeding practices in villages of central Karnataka. Indian pediatrics, 33, 477-480.

Bavdekar, S. B., Bavdekar, M. S., Kasla, R. R., Raghunandana, K. J., Joshi, S. Y., and Hathi, G. S. (1994).

Infant feeding practices in Bombay slums. Indian Pediatr, 31(9), 1083-7.

Beaton, G., Kelly, A., Kevany, J., Martorell, R., and Mason, J. (1990).

Appropriate uses of anthropometric indices in children. A report based on an ACC/SCN Workshop. Nutrition policy discussion paper.

Benakappa, A. D., and Shivamurthy, P. (2012).

Beliefs regarding diet during childhood illness. Indian journal of community medicine: official publication of Indian Association of Preventive and Social Medicine, 37(1), 20.

Benakappa, D. G., Raju, M., and Benakappa, A. D. (1989).

Breast-Feeding Practices in Rural Karnataka (India) with Special Reference to Lactation Failure. Pediatrics International, 31(4), 391-398.

Bentley, M. B., Engle, P. E., Caulfield, L., Creed, H., Penny, M. (1999)

Caregiver style of infant feeding as a determinant of dietary intake: The need for promotion of 'interactive feeding'. FASEB Journal 13, 195.1 Abstr.

Bernard, H. R. (1988).

Research methods in cultural anthropology (p. 117). Newbury Park, CA: Sage.

Betrán, A. P., de Onís, M., Lauer, J. A., and Villar, J. (2001).

Ecological study of effect of Breastfeeding on infant mortality in Latin America. Bmj, 323(7308), 303.

Bhandari, N., Bahl, R., Mazumdar, S., Martines, J., Black, R. E., and Bhan, M. K. (2003).

Effect of community-based promotion of exclusive breastfeeding on diarrhoeal illness and growth: a cluster randomised controlled trial. The Lancet, 361(9367), 1418-1423.

Bhandari, N., Bahl, R., Nayyar, B., Khokhar, P., Rohde, J. E. and Bhan, M. K. (2001)

Food supplementation with encouragement to feed it to infants from 4 to 12 months of age has a small impact on weight gain. J. Nutr. 131: 1946–1951.

Bhandari, N., Mazumder, S., Bahl, R., Martines, J., Black, R. E., and Bhan, M. K. (2004).

An educational intervention to promote appropriate complementary feeding practices and physical growth in infants and young children in rural Haryana, India. *The Journal of nutrition*, *134*(9), 2342-2348.

Bhandari, N., Mazumder, S., Bahl, R., Martines, J., Black, R. E., and Bhan, M. K. (2005).

Use of multiple opportunities for improving feeding practices in under twos within child health programmes. *Health policy and planning*, *20*(5), 328-336.

Bhanderi, D. J., Mukherjee, S. M., Gohel, M. K., and Christian, D. S. (2009).

An evaluation of the utilisation of reproductive and child health services provided by government to the rural community of Anand District, Gujrat. Indian journal of public health, 53(4), 250.

Bhutta, Z. A., Ahmed, T., Black, R. E., Cousens, S., Dewey, K., Giugliani, E., Haider, B. A., Kirkwood, B., Morris, S. S., Sachdev, H. P. S., and Shekar, M. (2008).

Maternal and Child Undernutrition 3: What works? Interventions for maternal and child undernutrition and survival. Child-Care Health and Development, 34(3), 404-404.

Bier, D.M., Brosnan, J.T., Flatt, J.P., Hanson, R.W., Weird, W., Hellerstein, M.K., Jequier, E., Kalhan, S., Koletzko, B., Macdonald, I., Owen, O., Uauy, R. (1999).

Report of the IDECG Working Group on lower and upper limits of carbohydrate and fat intake. Europ J Clin Nutr 1999;53:S177-8.

Birch, L. L., and Fisher, J. A. (1995).

Appetite and eating behavior in children. Pediatric Clinics of North America, 42(4), 931.

Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., de Onis, M., Ezzati, M., Mathers, C. Rivera, J. and Child Undernutrition Study Group. (2008).

Maternal and child undernutrition: global and regional exposures and health consequences. The lancet, 371(9608), 243-260.,

Bolam, A., Manandhar, D. S., Shrestha, P., Ellis, M., and de L Costello, A. M. (1998).

The effects of postnatal health education for mothers on infant care and family planning practices in Nepal: a randomised controlled trial. *BMJ: British Medical Journal*, *316*(7134), 805.

BPNI Bulletin (2006).

From the Desk of the National Coordinator; Repositioning Integrated Child Development Scheme; Breastfeeding Promotion Network of India (BPNI); Number 28, February 2006.

BPNI, UNICEF. (2003).

The State Consultation on Infant and Young Child Feeding, Department of Women and Child Development in collaboration with BPNI and UNICEF, 2003.

BPNI, Y.G. Consultants and Services (P) Ltd. (2009)

Assessment of Training on Infant and Young Child Feeding (IYCF) in Ferozpur District, Punjab. Annexure 6: Report on Capacity Building Training Course on Infant and Young Child Feeding Counseling for Development of Middle Level Trainers in 2 districts of Punjab (NRHM). Breastfeeding Promotion Network of India (BPNI). Available at http://www.BPNI.org

Bredenkamp, C., and Akin, J. S. (2004).

India's Integrated Child Development Services Scheme: Meeting the Health and Nutritional Needs of Children, Adolescent Girls and Women?'. Background report.

Britton, C., McCormick, F. M., Renfrew, M. J., Wade, A., and King, S. E. (2007).

Support for breastfeeding mothers. Cochrane Database Syst Rev, 1(1).

Brown, K. H., Dewey, K. G., Allen, L., and Saadeh, R. J. (1998).

Complementary feeding of young children in developing countries: a review of current scientific knowledge. Geneva: World Health Organization.

Brown, K. H., Dickin, K. L., Bentley, M. E., Oni, G. A., Obasaju, V. T., Esrey, S. A., Mebrahtu, S., Alade, I., and Stallings, R. Y. (1988).

Consumption of weaning foods from fermented cereals in Kwara State, Nigeria. In Improving young child feeding in Eastern and Southern Africa household-level food technology: Proceedings of a workshop held in Nairobi, Kenya 12 Oct 1987.

Brown, K. H., Peerson, J. M., Rivera, J., and Allen, L. H. (2002).

Effect of supplemental zinc on the growth and serum zinc concentrations of prepubertal children: a meta-analysis of randomized controlled trials. The American journal of clinical nutrition, 75(6), 1062-1071.

Brown, K. H., Stallings, R. Y., de Kanashiro, H. C., de Romana, G. L., and Black, R. E. (1990).

Effects of common illnesses on infants' energy intakes from breast milk and other foods during longitudinal community-based studies in Huascar (Lima), Peru. The American journal of clinical nutrition, 52(6), 1005-1013.

Brown, K., H. (2001)

A rational approach to feeding infants and young children with acute diarrhea. In: Lifschitz CH, ed., Pediatric Gastroenterology and Nutrition in Clinical Practice. New York: Marcel Dekker, Inc., 2001.

Butte, N. F., Lopez-Alarcon, M. G., and Garza, C. (2002).

Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life.

Caldeira, A. P., and Goulart, E. M. (2000).

Breastfeeding in Montes Claros, Minas Gerais: a representative sample study. J Pediatr (Rio J), 76(1), 65-72.

CARE. (1997).

Nutrition and Health Education Project Rajasthan: Final Evaluation Report. CARE-India, New Delhi.

Caulfield, L. E., Bentley, M. E., and Ahmed, S. (1996).

Is prolonged breastfeeding associated with malnutrition? Evidence from nineteen demographic and health surveys. International journal of epidemiology, 25(4), 693-703.

Caulfield, L. E., Huffman, S. L., and Piwoz, E. G. (1999).

Interventions to improve intake of complementary foods by infants 6 to 12 months of age in developing countries: impact on growth and on the prevalence of malnutrition and potential contribution to child survival. Food and Nutrition Bulletin, 20(2), 183-200.

Chandra, R. K. (1979).

Prospective studies of the effect of Breastfeeding on incidence of infection and allergy. Acta Paediatrica Scandinavica, 68(5), 691.

Charaka Samhita.

Charaka Samhita 46. p. 1164. Vol. III.

Château, P., Holmberg, H., Jakobsson, K., and Winberg, J. (1977).

A study of factors promoting and inhibiting lactation. Developmental Medicine and Child Neurology, 19(5), 575-584.

Chattopadhyay, D. (2004).

Knowledge and skills of anganwadi workers in Hooghly District, West Bengal. Indian Journal of Community Medicine, 29(3), 117

Chaturvedi, M., Nandan, D., and Gupta, S. C. (2007).

Rapid assessment of infant-feeding practices in Agra district. Indian Journal of Community Medicine, 32(3), 227.

Chauhan, M., Bala, R., Nandan, D., and Misra, S. K. (2007).

Complementary feeding practices in rural area of district Agra. *Indian journal of public health*, *51*(1), 66.

Chhabra, P., Grover, V. L., Aggarwal, O. P., and Dubey, K. K. (1998).

Breastfeeding patterns in an urban resettlement colony of Delhi. The Indian Journal of Pediatrics, 65(6), 867-872.

Chudasama, R. K., Patel, P. C., and Kavishwar, A. B. (2009).

Determinants of exclusive breastfeeding in south Gujarat region of India. Journal of Clinical Medicine Research, 1(2), 102.

Creed de Kanashiro, H., Penny, M., Robert, R., Narro, R., Caulfield, L., Black, R. (2001)

Improving infant nutrition through an educational intervention in the health services and the community. Presentation at the WHO Global Consultation on Complementary Feeding, Geneva, December 2001.

Cunningham, N. (1978).

The under fives clinic--what difference does it make?. The Journal of tropical pediatrics and environmental child health, 24(6), 239.

Davies-Adetugbo, A. A., and Adebawa, H. A. (1997).

The Ife South Breastfeeding Project: training community health extension workers to promote and manage breastfeeding in rural communities. Bulletin of the World Health Organization, 75(4), 323.

Daxini, M., and Kanani, S. (2008).

The quality of care in nongovernmental organization-implemented Integrated Child Development Services in rural Vadodara, India; Maternal and child health. In HEALTH FORUM (Vol. 12, No. 2, p. 28).

Daxini, M., and Kanani, S. (2009)

Health System Research For Improving Quality of Supplementations of Nutritional Services For Children Below 3 Years in NGO Managed ICDS in Rural Vadodara. PhD Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

de Carvalho, M., Klaus, M. H., and Merkatz, R. B. (1982).

Frequency of breast-feeding and serum bilirubin concentration. Archives of Pediatrics and Adolescent Medicine, 136(8), 737.

de Onis, M., Wijnhoven, T., and Onyango, A. W. (2004).

Worldwide practices in child growth monitoring. The journal of pediatrics, 144(4), 461-465.

Dennison, B. A., Rockwell, H. L., and Baker, S. L. (1997).

Excess fruit juice consumption by preschool-aged children is associated with short stature and obesity. Pediatrics, 99(1), 15-22.

Deolalikar, A. (2005).

Attaining the Millennium Development Goals in India: How Likely and What Will it Take to Reduce Infant Mortality, Child Malnutrition, Gender Disparities and Hunger-Poverty and to Increase School Enrollment and Completion. Washington DC: World Bank.

Deshpande, J. D., Giri, P. A., Phalke, D. B., Phalke, V. D., Kalakoti, P., and Syed, M. M. (2010).

Socio-cultural practices in relation to breastfeeding, weaning and child rearing among Indian mothers and assessment of nutritional status of children under five in rural India. AMJ, 3, 618-24.

Dewey, K. G. (2001).

Nutrition, Growth, and Complementary Feeding of The Brestfed Infant. Pediatric Clinics of North America, 48(1), 87-104.

Dewey, K. G., and Adu-Afarwuah, S. (2008).

Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. Maternal and Child Nutrition, 4(s1), 24-85.

Dewey, K. G., and Brown, K. H. (2003).

Update on technical issues concerning complementary feeding of young children in developing countries and implications for intervention programs. Food and Nutrition Bulletin-United Nations University-, 24(1), 5-28.

DHS. (1992).

Pakistan Demographic and Health Survey 1990-1991. Calverton, MD, Macro International Inc; National Institute of Population Studies and IRB/Macro International, Inc. 1992.

DHS. (2008).

Pakistan Demographic and Health Survey 2006-07. Islamabad, Pakistan, National Institute of Population Studies and Macro International Inc; National Institute of Population Studies (NIPS) and Macro International, Inc. 2008.

Disha, A. D., Rawat, R., Subandoro, A., and Menon, P. (2012).

Infant and young child feeding (IYCF) practices in Ethiopia and Zambia and their association with child nutrition: Analysis of demographic and health survey data. African Journal of Food, Agriculture, Nutrition and Development, 12(2), 5895-5914.

DLHS-3. (2010).

District Level Household and Facility Survey, 2007-08: International Institute for Population Sciences (IIPS). India. Gujarat: Mumbai: IIPS.

Dubowitz, T., Levinson, D., Peterman, J. N., Verma, G., Jacob, S., and Schultink, W. (2007).

Intensifying efforts to reduce child malnutrition in India: An evaluation of the Dular program in Jharkhand, India. Food Nutrtion Bulletin, 28(3), 266-273.

Duncan, B., Ey, J., Holberg, C. J., Wright, A. L., Martinez, F. D., Taussig, L. M. (1993).

Exclusive breast-feeding for at least 4 months protects against otitis media. Pediatrics. 1993 May;91(5):867-72.

Edmond, K. M., Kirkwood, B. R., Amenga-Etego, S., Owusu-Agyei, S., and Hurt, L. S. (2007).

Effect of early infant feeding practices on infection-specific neonatal mortality: an investigation of the causal links with observational data from rural Ghana. The American journal of clinical nutrition, 86(4), 1126-1131.

Edmond, K. M., Zandoh, C., Quigley, M. A., Amenga-Etego, S., Owusu-Agyei, S., and Kirkwood, B. R. (2006).

Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatrics, 117(3), e380-e386.

Ejemot-Nwadiaro, R. I., Ehiri, J. E., Meremikwu, M. M., and Critchley, J. A. (2008).

Hand washing for preventing diarrhoea. *Cochrane Database of Systematic Reviews* 2008, Issue 1. Art. No.: CD004265.

Ekambaram, M., Bhat, V. B., and Padiyath Ahamed, M. A. (2010).

Knowledge, attitiude and practice of breastfeeding among postnatal mothers. *Curr Pediatr Res 2010; 14 (2): 119*, *124*.

Engle, P. L. (2002).

Infant feeding styles: barriers and opportunities for good nutrition in India. Nutrition reviews, 60(s5), S109-S114.

Engle, P. L., and Lhotska, L. (1999).

The role of care in programmatic actions for nutrition: Designing programmes involving care. Food and Nutrition Bulletin, 20(1), 121-135.

Engle, P. L., Bentley, M., and Pelto, G. (2000).

The role of care in nutrition programmes: current research and a research agenda. In Proceedings-Nutrition Society Of London (Vol. 59, No. 1, pp. 25-35). CABI Publishing; 1999.

Epi_Info, Version 6.04_d. (2001).

A word processing, Database, and Statistical Programme for Public Health on IBM-compatible Microcomputers. Centers for Disease Control and Prevention. Atlanta, Georgia, USA Developed by Dean AG, Coulombier D, Brendel KA, Smith DC, Burton AG, Dicker RC, Sullivan K, Fagan RF, Arner TG.

Ertem, I. O., Votto, N., and Leventhal, J. M. (2001).

The timing and predictors of the early termination of breastfeeding. Pediatrics, 107(3), 543-548.

Esrey, S. A., Habicht, J. P. and Casella, G. (1992)

The complementary effect of latrines and increased water usage on the growth of infants in rural Lesotho. Am. J. Epidemiol. 135: 659–666.

Feachem, R. G., Koblensky, M. A. (1993).

Interventions for the control of diarrhoeal diseases among young children: promotion of breastfeeding. Bulletin of the World Health Organization, 1993, 62: 271-291.

Fergusson, D. M., Beautrais, A. L., Silva, P.A. (1982).

Breast-feeding and cognitive development in the first seven years of life. Soc Sci Med, 1982, 16(19):1705-8.

Garner, P., Panpanich, R., Logan, S. (2000).

Is routine growth monitoring effective? A systematic review of trials. Arch Dis Child. 2000 Mar;82(3):197-201. Review.

George, S.M., Latham, M.C., Abel, R., Ethirajan, N., Frongillo, EA. Jr. (1993).

Evaluation of effectiveness of good growth monitoring in south Indian villages. Lancet. 1993 Aug 7;342(8867):348-52.

Ghosh, S. (1997)

Integrated Child development Services Programme - need for reappraisal. Indian Pediatrics, 1997, Vol. 34, pp. 911-918.

Ghosh, S. (2004).

"Child Malnutrition." Economic and Political Weekly 39 (40): 4412-14.

Ghosh, S. Gidwani, S., Mittal, S. K., and Verma, R. K. (1976).

Socio-cultural factors affecting Breastfeeding and other infant feeding practices in an urban community. Indian pediatrics, 13(11), 827.

Ghosh, S., Kilaru, A., and Ganapathy, S. (2002).

Nutrition education and infant growth in rural Indian infants: narrowing the gender gap?. *Journal of the Indian Medical Association*, *100*(8), 483-490

Gibson, R. (1989).

Principles of Nutritional Assessment, Oxford University Press, New York.

Gibson, R. S., Ferguson, E. L., and Lehrfeld, J. (1998).

Complementary foods for infant feeding in developing countries: their nutrient adequacy and improvement. European Journal of Clinical Nutrition, 52(10), 764.

Gillie, L. (1976).

Difficulties and discouragement encountered by mother. J Hum Nutr 1976, 30: 248.

Gittelsohn, J., Shankar, A. V., West, K. P., Faruque, F., Gnywali, T., and Pradhan, E. K. (1998).

Child feeding and care behaviors are associated with xerophthalmia in rural Nepalese households. Social Science and Medicine, 47(4), 477-486.

Gopalan, C. (1992).

'Growth Charts in Primary Child-Healthcare: Time for Reassessment', Indian Journal of Maternal and Child Health, Vol 3(4), pp 98-103.

Gopaldas, T., Christian, P. S., Abbi, R. D., and Gujral, S. (1990).

Does growth monitoring work as it ought to in countries of low literacy?. Journal of tropical pediatrics, 36(6), 322-327.

Gottert, P. (1995).

Final Report: Mali Nutrition Communication Project, 1989-1995. Washington, D.C.: Academy for Educational Development May 1995.

Government of India, (GOI) (2006).

Ministry of Women and Child Development-Govt of India. National Guidelines on Infant and Young Child Feeding, 2nd edition 2006: Available from: http://wcd.nic.in/.

Government of India, (GOI) (2007).

ICDS and Nutrition in the Eleventh Five Year Plan. Working Group on Development of Children for the Eleventh Five Year Plan (2007-2012) – A Report. Ministry of Women and Child Development, Government of India.

Gragnolati, M., Bredenkamp, C., Gupta, M. D., Lee, Y. K., and Shekar, M. (2006).

ICDS and persistent undernutrition: Strategies to enhance the impact. Economic and Political Weekly, 1193-1201.

Griffin, I. J., Abrams, S. A. (2001).

Iron and breastfeeding. Pediatr Clin N Amer 2001;48:401-14.

Griffiths, M. (1981).

Growth Monitoring. American Public Health Association: Washington, DC. (Primary health care issues, series 1, no. 3).

Guise, J. M., Palda, V., Westhoff, C., Chan, B. K., Helfand, M., and Lieu, T. A. (2003).

US Preventive Services Task Force. The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force. Ann Fam Med, 1(2), 70-8.

Guldan, G. S., Fan, H. C., Ma, X., Ni, Z. Z., Xiang, X., and Tang, M. Z. (2000).

Culturally appropriate nutrition education improves infant feeding and growth in rural Sichuan, China. The Journal of Nutrition, 130(5), 1204-1211.

Gupta, A. (2000).

Promoting and supporting breastfeeding for optimal nutrition during infancy. Journal of the Indian Medical Association, 98(9), 543.

Gupta, A., (2007).

Breastfeeding: The 1st Hour Save ONE Million Babies. PowerPoint presentation at gold 07 global online lactation discussions

Gupta, A., and Gupta, Y. P. (2004).

Status of Infant and Young Child Feeding IN 49 District (98 Blocks) of India 2003 - A National Report of the Quantitative Study; Breastfeeding Promotion Network of India (BPNI), 2004.

Gupta, A., Sharma, D. (2006).

Status of Infant and Young Child Feeding Uttarakhand - A Report of the Study from 13 Districts; Department of Women Empowerment and Child Development, Uttarakhand and Breastfeeding Promotion Network of India (BPNI).

Gupta, A., Sobti, J., and Rohde, J. E. (1992).

Infant feeding practices among patients of pediatricians and general practitioners. The Indian Journal of Pediatrics, 59(2), 193-196.

Gupta, P., Srivastava, V. K., Kumar, V., Jain, S., Masood, J., Ahmad, N., and Srivastava, J. P. (2010).

Newborn care practices in urban slums of Lucknow city, UP. *Indian journal of community medicine: official publication of Indian Association of Preventive and Social Medicine*, *35*(1), 82.

Guyon, A. B., Quinn, V. J., Hainsworth, M., Ravonimanantsoa, P., Ravelojoana, V., Rambeloson, Z., and Martin, L. (2009).

Implementing an integrated nutrition package at large scale in Madagascar: the Essential Nutrition Actions framework. *Food and Nutrition Bulletin*, *30*(3), 233-244.

Guyon, A., Quinn, V., Rambeloson, Z., and Hainsworth, M. (2006).

Using the Essential Nutrition Actions approach to improve the nutritional practices of women and children at scale in Antananarivo and Fianarantsoa provinces of Madagascar: results and trends 2000–2005. Final Report, July 2006. LINKAGES, USAID.

Habicht, J., P. (2000).

The association between prolonged breastfeeding and poor growth. In: Koletzko B, Michaelsen KF, Hernell O, eds., Short and Long Term Effects of Breastfeeding on Child Health. New York: Kluwer Academic/Plenum Publishers, 2000, pp. 193-200.

Haider, R., Ashworth, A., Kabir, I., and Huttly, S. R. (2000).

Effect of community-based peer counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a randomised controlled trial [see commments]. Lancet, 356(9242), 1643.

Haider, R., Kabir, I., Huttly, S. R., Ashworth, A. (2002).

Training peer counselors to promote and support exclusive breastfeeding in Bangladesh. J Hum Lact. 2002 Feb;18(1):7-12.

Hall, R. T., Mercer, A. M., Teasley, S. L., McPherson, D. M., Simon, S. D., Santos, S. R., Meyers, B. M., and Hipsh, N. E. (2002).

A breast-feeding assessment score to evaluate the risk for cessation of breast-feeding by 7 to 10 days of age. The Journal of pediatrics, 141(5), 659-664.

Hanif, H. M. (2011).

Trends in breastfeeding and complementary feeding practices in Pakistan, 1990-2007. International breastfeeding journal, 6(1), 1-7.

Haq, Z., and Hafeez, A. (2009).

Knowledge and communication needs assessment of community health workers in a developing country: a qualitative study. Human resources for health, 7(1), 59.

Hendrata, L., and Johnston, M. (1978).

Manual for Community Based Underfives Weighing Program. Yayasan Indonesia Sejahtera.

Horton, S., Sanghvi, T., Phillips, M., Fiedler, J., Perez-Escamilla, R., Lutter, C., Rivera, A., Segall-Correa, A., M. (1996).

Breastfeeding promotion and priority setting in health. Health Policy Plan. 1996 Jun;11(2):156-68.

Howie, P. W., Forsyth, J. S., Ogston, S. A., Clark, A., and Florey, C. D. (1990).

Protective effect of Breastfeeding against infection. BMJ: British Medical Journal, 300(6716), 11.

International Baby Food Action Network (IBFAN). (2007).

Timely Initiation of Breastfeeding within 1st Hour of Birth - Giving the Best Chance of Life and Health!. Produced under the IBFAN Asia Pacific Strategic Plan 2003-2007, jointly funded by Swedish International Development Cooperation Agency (Sida) and Netherlands Ministry of Cooperation and Development (DGIS).

Isenalumhe, A. E., and Oviawe, O. (1987).

Prelacteal feeds and breast-feeding problems. The Indian Journal of Pediatrics, 54(1), 89-96.

Islam, M. A., Rahman, M. M., and Mahalanabis, D. (1994).

Maternal and socioeconomic factors and the risk of severe malnutrition in a child: a case-control study. European journal of clinical nutrition, 48(6), 416.

Jain, S., Parmar, V. R., Singla, M., and Azad, C. (2009).

Problems of Breastfeeding from birth till discharge-Experience in a medical college in Chandigarh. Indian journal of public health, 53(4), 264.

Jelliffe, D. B. (1966).

The assessment of the nutritional status of the community. W.H.O. Monogra Series, No. 53, Geneva, 1966.

Jelliffe, D. B., and Jelliffe, E. P. (1983).

Breastfeeding: world significance in obstetric practice. Journal of Tropical Pediatrics, 29(3), 130-132.

Johnson, S. L., and Birch, L. L. (1994).

Parents' and children's adiposity and eating style. *Pediatrics*, *94*(5), 653-661.

Jones, G., Steketee, R. W., Black, R. E., Bhutta, Z. A., and Morris, S. S. (2003).

How many child deaths can we prevent this year?. Lancet, 362(9377), 65-71.

Jonsson, U. (1993).

"Integrating political and economic factors within nutrition-related policy research: an economic perspective." In P. Pinstrup-Andersen (ed.), The Political Economy of Food and Nutrition Policies. Baltimore: Johns Hopkins University Press.

Kamudoni, P. R., Maleta, K., Shi, Z., de Paoli, M. M., and Holmboe-Ottesen, G. (2010).

Breastfeeding perceptions in communities in Mangochi district in Malawi. Acta Paediatrica, 99(3), 367-372.

Kanani, S. (1993).

Community based comprehensive health care program in the slums of Baroda. The baseline survey report. Baroda Citizens Council, Vadodara, 1993.

Kanani, S. (2008).

Assessment of IEC Activities of Government Health Centers and ICDS Anganwadis – Towards Reduction of Undernutrition in Gujarat Project Highlights, Department of Health and Family Welfare, Government of Gujarat. Available online: ftp://ftp.solutionexchange.net.in/public/mch/cr/res19011103.pdf

Kanani, S., Gadre, A. (2003).

Study of Care giving behaviors related to feeding practices in children (3-36 months) with a focus on the comparative scenario in rural and urban areas of Vadodara city: M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Kanani, S., Katwala, P. (2006).

Improving the quality of home visits in ICDS urban Vadodara: A capacity building intervention of ICDS functionaries. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Kanani, S., Majumdar, S. (2009).

Control of Micronutrient Malnutrition through integrated health-nutrition days; a study of the urban MAMTA divas in Vadodara. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Kanani, S., Malik, A. (2002).

Nutritional status of Lactating Mothers and Infant Feeding Practices among Urban poor in Vadodara. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Kanani, S., Zararia, V. (1996).

Integrated Child Development Services (ICDS). As People View It: A Social Assessment of ICDS in Gujarat. Department of Foods and Nutrition, University of Baroda, Vadodara, 1996.

Kapil, U., and Pradhan, R. (1999).

Integrated Child Development Services scheme (ICDS) and its impact on nutritional status of children in India and recent initiatives. *Indian journal of public health*, *43*(1), 21.

Kapil, U., Paul, D., Manocha, S., and Sood, A. K. (1991).

Assessment of knowledge and skills about growth monitoring amongst child development project officers. Indian pediatrics, 28(6), 641.

Kapil, U., Saxena, N., Nayar, D., and Gnanasekaran, N. (1996).

Status of growth monitoring activities in selected ICDS projects of Rajasthan. Indian pediatrics, 33, 949-951.

Kapil, U., Saxena, N., Nayar, D., and Gnanasekaran, N. (1996).

Status of growth monitoring activities in selected ICDS projects of Rajasthan. Indian pediatrics, 33, 949-951.

Kapil, U., Sood, A. K., and Gaur, D. R. (1990).

Maternal beliefs regarding diet during common childhood illnesses. Indian pediatrics, 27(6), 595-599.

Kapil, U., Verma, D., Narula, S., Nayar, D., Sachdev, H. P. S., Shah, A. D., and Gnanasekaran, N. (1994).

Breast-feeding practices in schedule caste communities in Haryana state. Indian pediatrics, 31, 1227-1227.

Kapil, U., Verma, D., Sachdev, H. P. S., Nayar, D., Shah, A. D., and Gnanasekaran, N. (1995).

Use of milk based commercial weaning foods amongst scheduled caste communities in Haryana. *Indian pediatrics*, *32*, 905-905.

Kapur, D., Sharma, S., and Agarwal, K. N. (2005).

Dietary intake and growth pattern of children 9-36 months of age in an urban slum in Delhi. Indian Pediatr, 42(4), 351-356.

Karim, F., Huq, N., Brown, L., and Chowdhury, A. M. R. (1994).

Growth monitoring in the context of a primary health care programme. Food And Nutrition Bulletin-United Nations University-, 15, 192-192

Kashyap, P. (1990).

Assessing nutrition problems in India using Rapid Rural Appraisal Methods. In: Community Nutrition Research: Making it rapid, responsive, and relevant. Cervinskas J and Young RH (ed.), IDRC, CRDI, CIID, Canada; 18-22

Katara, P. S., Patel, S. V., Mazumdar, V. S., Shringarpure, K. (2010).

A Study on Feeding Practices among Children Aged 6 Months to 2 Years in Urban Slums of Vadodara, Indian Journal Of Maternal And Child Health,2010 Jul – Sep;12(3)

Kaushik, A. (1983).

Feeding and rearing practices in rural area of Jhansi-Bundelkhand. The Indian Journal of Pediatrics, 50(1), 33-37.

Khan, A. M., Kayina, P., Agrawal, P., Gupta, A., and Kannan, A. T. (2012).

A study on infant and young child feeding practices among mothers attending an urban health center in East Delhi. Indian journal of public health, 56(4), 301.

Khan, Z., Mehnaz, S., Khalique, N., Ansari, M. A., and Siddiqui, A. R. (2009).

Poor perinatal care practices in urban slums: possible role of social mobilization networks. Indian journal of community medicine: official publication of Indian Association of Preventive and Social Medicine, 34(2), 102.

Kielmann, A. A., Taylor, C. E., and Parker, R. L. (1978).

The Narangwal Nutrition Study: a summary review. The American journal of clinical nutrition, 31(11), 2040-2057.

Kilaru, A., Griffiths, P. L., Ganapathy, S., and Shanti, G. (2005).

Community-based nutrition education for improving infant growth in rural Karnataka. Indian Pediatrics, 42(5), 425.

Kimmons, KH Brown, A. Lartey, E. Collison, PPA Mensah, KG Dewey, J. E. (1999).

The effects of fermentation and/or vacuum flask storage on the presence of coliforms in complementary foods prepared for Ghanaian children. International journal of food sciences and nutrition, 50(3), 195-201.

Kishore, M. S. S., Kumar, P., and Aggarwal, A. K. (2009).

Breastfeeding knowledge and practices amongst mothers in a rural population of North India: a community-based study. Journal of tropical pediatrics, 55(3), 183-188.

Kleinman, R. L., Senanayake, P. (eds). (1987).

Breastfeeding: fertility and contraception. London, International Planned Parenthood Federation, 1987.

Kotecha, I., and Singh, M. P. (2012).

Process Evaluation of Health and Nutrition Day (*MAMTA DAY*) in Urban Slum Areas of Bhavnagar Municipal Corporation. National Journal of Integrated Research in Medicine, 3(1), 111-114.

Kramer, M. S., and Kakuma, R. (2002).

Optimal duration of exclusive breastfeeding (Cochrane Review). The Cochrane Library, 4.

Kramer, M. S., and Kakuma, R. (2009).

Optimal duration of exclusive breastfeeding. Cochrane Database of Systematic Reviews 2002, Issue 1.

Kull, I., Wickman, M., Lilja, G., Nordvall, S. L., and Pershagen, G. (2002).

Breastfeeding and allergic diseases in infants—a prospective birth cohort study. Archives of disease in childhood, 87(6), 478-481.

Kumar, D., Goel, N. K., Mittal, P. C., and Misra, P. (2006).

Influence of infant-feeding practices on nutritional status of under-five children. The Indian Journal of Pediatrics, 73(5), 417-421.

Kumar, N., Shekhar, C., Kumar, P., and Kundu, A., S. (2007).

Kuppuswamy's Socioeconomic Status Scale-Updating for 2007. Indian J Pediatr 2007; 74:1131-2

Labbok, M. H., Hight-Laukaran, V., Peterson, A. E., Fletcher, V., von Hertzen, H., Van Look, P., F. (1997).

Multicenter study of the Lactational Amenorrhea Method (LAM): I. Efficacy, duration, and implications for clinical application. Contraception. 1997 Jun;55(6):327-36.

Lalitha, N. V., Standley, J. (1988).

Training workers and Supervisors in growth monitoring: looking at ICDS. Indian Journal of Pediatrics 55 (Suppl.), S44–S54.

Lokshin, M., Das Gupta, M., Gragnolati, M., and Ivaschenko, O. (2005).

Improving child nutrition? The integrated child development services in India. Development and Change, 36(4), 613-640.

Lu, M. C., Lange, L., Slusser, W., Hamilton, J., and Halfon, N. (2001).

Provider encouragement of breast-feeding: evidence from a national survey. Obstetrics and Gynecology, 97(2), 290-295.

Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., and Namey, E. (2005).

Qualitative research methods: A data collector's field guide (pp. 6-9). ^ eEEUU EEUU: Family Health International.

Mahmood, S. E., Srivastava, A., Shrotriya, V. P., and Mishra, P. (2012).

Infant feeding practices in the rural population of north India. Journal of Family and Community Medicine, 19(2), 130.

Mahmud, K., Ayazuddin, Awan, R. (2007a).

Pakistan Social and Living Standard Measurement Survey - 2005-06 Islamabad; 2007.

Mahmud, K., Ayazuddin, Awan, R. (2007b)

Pakistan Social and Living Standard Measurement Survey - 2007-08 Islamabad; 2007.

Mallikarjuna, H. B., Banapurmath, C. R., Banapurmath, S., and Kesaree, N. (2002).

Breastfeeding problems in first six months of life in rural Karnataka. Indian pediatrics, 39(9), 861-865.

Maluccio, J., A. and Flores, R. (2004).

Impact evaluation of a conditional cash transfer program: the Nicaraguan *Red de protección social*. IFPRI FCND Discussion Paper No. 184.Washington, DC.

Mandal, P. K., Sardar, J. C., Chatterjee, C., Lahiri, S. K., and Ghosh, P. K. (2007).

A study on Breastfeeding practices among infants in a rural area of west Bengal. Indian J Prev Soc Med, 38, 28-31.

Marek, T., Diallo, I., Ndiaye, B., Rakotosalama, J. (1999).

Successful contracting of prevention services: fighting malnutrition in Senegal and Madagascar. Health Policy Plan. 1999 Dec;14(4):382-9.

Martinez, B. C., de Zoysza, I., Glass, R.I. (1992).

The magnitude of the global problem of diarrhoeal disease: a ten-year update. Bull WHO 1992;70:705-14.

Mass, S. (2004).

Breast pain: engorgement, nipple pain and mastitis. Clinical Obstetrics and Gynecology. 2004; 47:676-682

Matthiesen, A. S., Ransjö-Arvidson, A. B., Nissen, E., and Uvnäs-Moberg, K. (2001).

Postpartum maternal oxytocin release by newborns: effects of infant hand massage and sucking. Birth, 28(1), 13-19.

Mehan, M., and Yadav, P. (2004).

Situational Analysis of key Nutritional and Health related household and community practices in rural Baroda: The IMNCI Approach. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Mertens, T. E., Fernando, M. A., Cousens, S. N., Kirkwood, B. R., Feachem, R. G., and Marshall, T. D. C. (1990).

Childhood diarrhoea in Sri Lanka: a case-control study of the impact of improved water sources. Tropical medicine and parasitology, 41, 98-104.

Milena, Z. R., (2007).

Qualitative Research Methods: A Comparison Between Focus-Group And In-Depth Interview. Annals of the University of Oradea 17, 1279-1283.

Milner, J. A., and Allison, R. G. (1999).

The role of dietary fat in child nutrition and development: summary of an ASNS workshop. The Journal of nutrition, 129(11), 2094-2105.

Ministry of Social Welfare. (1984).

Indian National Code for Protection and Promotion of Breast-feeding. Indian Pediatrics 1984 Mar; 21(3):259-64

Möller, T., Olsson, H., Ranstam, J., and Bergkvist, L. (2002).

Breast cancer and breastfeeding: collaborative reanalysis of individual data from 47 epidemiological studies in 30 countries, including 50302 women with breast cancer and 96973 women without the disease. Lancet, 360(9328), 187-95.

Monte, C. M., Ashworth, A., Nations, M. K., Lima, A. A., Barreto, A., and Huttly, S. R. (1997).

Designing educational messages to improve weaning food hygiene practices of families living in proverty. Social science and medicine, 44(10), 1453-1464.

Morrow, A. L., Guerrero, M. L., Shults, J., Calva, J. J., Lutter, C., Bravo, J. Ruiz-Palacios, G., Morrow, R., C., and Butterfoss, F. D. (1999).

Efficacy of home-based peer counselling to promote exclusive breastfeeding: a randomised controlled trial. The Lancet, 353(9160), 1226-1231.

Mortensen, E. L., Michaelsen, K. F., Sanders, S. A., and Reinisch, J. M. (2002).

The association between duration of breastfeeding and adult intelligence. JAMA: the journal of the American Medical Association, 287(18), 2365-2371.

Mosley, W. H., and Chen, L. C. (1984).

An analytical framework for the study of child survival in developing countries. Population and development review, 10, 25-45.

Moursi M., Mbemba F. and Treche S. (2003)

Does the consumption of amylase-containing gruels impact on the energy intake and growth of Congolese infants? *Public Health Nutrition* **6**, 249–258.

Msefula, D. (1993).

How can growth monitoring and special care of underweight children be improved in Zambia? Tropical Doctor 23, 107–112.

Nath, K. J., Bloomfield, S., and Jones, M. (2006).

Household water storage, handling and point-of-use treatment. A review commissioned by IFH.

Naylor, A. J., and Morrow, A. L. (2001).

Developmental Readiness of Normal Full Term Infants To Progress from Exclusive Breastfeeding to the Introduction of Complementary Foods: Reviews of the Relevant Literature Concerning Infant Immunologic, Gastrointestinal, Oral Motor and Maternal Reproductive and Lactational Development.

Neifert, M., Lawrence, R., and Seacat, J. (1995).

Nipple confusion: toward a formal definition. The Journal of pediatrics, 126(6), S125-S129.

NFHS–1. (1993).

National Family Health Survey, 1992-93, India. International Institute for Population Science (IIPS) and Macro International, Mumbai, India.

NFHS–2. (1999).

National Family Health Survey, 1998-99, India. International Institute for Population Science (IIPS) and Macro International, Mumbai, India.

NFHS–3. (2007).

National Family Health Survey, 2005-06, India. International Institute for Population Science (IIPS) and Macro International, Mumbai, India.

NFHS–3. Gujarat (2008).

International Institute for Population Sciences (IIPS) and Macro International. National Family Health Survey (NFHS-3), India, 2005-06: Gujarat. Mumbai: IIPS.

NIPCCD (National Institute of Public Cooperation and Child Development). (1992).

National evaluation of Integrated Child Development Services. New Delhi: NIPCCD

Nissen, E., Lilja, G., Widström, A. M., and Uvnäs-Moberg, K. (1995).

Elevation of oxytocin levels early post partum in women. Acta obstetricia et gynecologica Scandinavica, 74(7), 530-533.

NNMB. (2006).

National Nutrition Monitoring Bureau Reports (2006-07). Hyderabad : National Nutrition Monitoring Bureau (NNMB) , 2006.

Northstone, K., Emmett, P., and Nethersole, F. (2001).

The effect of age of introduction to lumpy solids on foods eaten and reported feeding difficulties at 6 and 15 months. Journal of human nutrition and dietetics, 14(1), 43-54.

O'Brien, O'Brien, H., B. (1978).

Communication of Innovation in Health Care. M.Sc. Thesis. London School of Hygiene and Tropical Medicine: London

Onyango, A. W., Esrey, S. A., and Kramer, M. S. (1999).

Continued breastfeeding and child growth in the second year of life: a prospective cohort study in western Kenya. The Lancet, 354(9195), 2041-2045.

Onyango, A., W. (2000).

Breastfeeding and growth in rural Kenyan toddlers. Adv. Exp. Med. Biol. 478: 151–162.

Pan American Health Organization. (PAO) (2003).

Guiding principles for complementary feeding of the breastfed child. Washington, DC: Pan American Health Organization and World Health Organization, 2003.

Pandit, N., Yeshwanth, M., and Albuquerque, S. I. (1994).

Factors influencing initiation of breastfeeding in an urban set up. Indian pediatrics, 31, 1558-1558.

Pant, I., and Chothia, K. (1990).

Maternal knowledge regarding Breastfeeding and weaning practices. The Indian Journal of Pediatrics, 57(3), 395-400.

Parikh, P., and Sharma, K. (2011).

Knowledge and Perceptions of ICDS Anganwadi Workers with Reference To Promotion of Community Based Complementary Feeding Practices in Semi Tribal Gujarat. National Journal, 2, 457-467.

Parmar, V. R., Salaria, M., Poddar, B., Singh, K., and Ghotra, H. (2000).

Knowledge, attitudes and practices (KAP) regarding Breastfeeding at Chandigarh. Indian journal of public health, 44(4), 131.

Patel, A., Pusdekar, Y., Badhoniya, N., Borkar, J., Agho, K. E., and Dibley, M. J. (2012).

Determinants of inappropriate complementary feeding practices in young children in India: secondary analysis of National Family Health Survey 2005–2006. Maternal and child nutrition, 8(s1), 28-44.

Pathi, S., and Das, B. C. (2005).

Breastfeeding practices in a rural ICDS block of Khallikote, South Orissa. Indian Journal of Community Medicine, 30(4).

Pelto, G. H., Levitt, E., and Thairu, L. (2003).

Improving feeding practices: current patterns, common constraints, and the design of interventions. FOOD AND NUTRITION BULLETIN-UNITED NATIONS UNIVERSITY-, 24(1), 45-82.

Penny, M. E., Creed-Kanashiro, H. M., Robert, R. C., Narro, M. R., Caulfield, L. E., and Black, R. E. (2005).

Effectiveness of an educational intervention delivered through the health services to improve nutrition in young children: a cluster-randomised controlled trial. The Lancet, 365(9474), 1863-1872.

Philips, N., (2000).

Early child feeding practices in Maharashtra, India: relationship with child growth and maternal time allocation [Dissertation]. Tufts University. 2000

Popkin, B. M., Adair, L., Akin, J. S., Black, R., Briscoe, J., and Flieger, W. (1990).

Breast-feeding and diarrheal morbidity. Pediatrics, 86(6), 874-882.

Prentice, A. M., and Paul, A. A. (2000).

Fat and energy needs of children in developing countries. The American journal of clinical nutrition, 72(5), 1253s-1265s.

Prinja, S., Verma, R., and Lal, S. (2008).

Role of ICDS program in delivery of nutritional services and functional integration between anganwadi and health worker in north India. The Internet Journal of Nutrition and Wellness, 5(2).

Rae, Galloway. (2006).

Infant And Young Child Feeding. New Directions And Program Strategies - Global Health Mini-University - October 27, 2006.

Ramachandran, P., and Gopalan, H. S. (2009).

Undernutrition and risk of infections in preschool children. Indian J Med Res, 130(5), 579-83.

Ramji, S. (2009).

Impact of infant and young child feeding and caring practices on nutritional status and health. *Indian J MedRes*, *130*(5), 624-6.

Ramkrishna, M., N. (2000).

A study in breastfeeding practices in a rural coal mine area of Andhra Pradesh. Indian J Public Health 2000; 44:65-6.

Rao, K. V., Mishra, V. K., and Retherford, R. D. (1998).

Mass media can help improve treatment of childhood diarrhoea. NFHS Subject Report No. 10.IIPS, India and East-West Centre, Program on Population, Honolulu, USA.

Rasania, S. K., Singh, S. K., Pathi, S., Bhalla, S., and Sachdev, T. R. (2003).

Breastfeeding practices in maternal and child health centre in Delhi. Health Popul Perspect Issues, 26, 110-115.

Rashmi and Vijaykumar, B. (2010).

Quality assessment of child care services in primary health care settings of Central Karnataka (Davangere District). Indian journal of community medicine: official publication of Indian Association of Preventive and Social Medicine, 35(1), 24.

Raval, D., Jankar, D. V., and Singh, M. P. (2011).

A study of Breastfeeding practices among infants living in slums of Bhavnagar city, Gujarat, India. Religion, 78(5.44), 0-019.

Ray, S. K. (2011).

Evidence-Based preventive interventions for targeting under-nutrition in the Indian context. Indian Journal of Public Health, 55(1), 1.

Ray, S., K. (2005).

Special article: Action for tackling malnutrition: Growth monitoring or surveillance? Indian Journal of Public Health, Year 2005, Volume 49, Issue 4 [p. 214-217]

Redmond, E. C., Griffith, C. J., and Riley, S. (2009).

Contamination of bottles used for feeding reconstituted powdered infant formula and implications for public health. Perspectives in public health, 129(2), 85-94.

Righard, L. (1996).

Early enhancement of successful breast-feeding. World Health Forum 1996, 17(1):92-7.

Righard, L. (1998).

Are breastfeeding problems related to correct breastfeeding technique and the use of pacifiers and bottles? Birth 1998, 25(1):40-4.

Righard, L., and Alade, M. O. (1992).

Sucking technique and its effect on success of breastfeeding. Birth, 19(4), 185-189.

Rivera Dommarco, J., Santizo, M. C., and Hurtado, E. (1998).

Diseño y evaluación de un programa educativo para mejorar las prácticas de alimentación en niños de 6 a 24 meses de edad en comunidades rurales de Guatemala.

Roy, N. C. (2011).

Use of mid-upper arm circumference for evaluation of nutritional status of children and for identification of high-risk groups for malnutrition in rural Bangladesh. Journal of Health, Population and Nutrition (JHPN), 18(3), 171-180.

Roy, S. K., Fuchs, G. J., Mahmud, Z., Ara, G., Islam, S., Shafique, S., Akter S., S. and Chakraborty, B. (2005).

Intensive nutrition education with or without supplementary feeding improves the nutritional status of moderately-malnourished children in Bangladesh.

Roy, S. K., Jolly, S. P., Shafique, S., Fuchs, G. J., Mahmud, Z., Chakraborty, B., and Roy, S. (2007).

Prevention of malnutrition among young children in rural Bangladesh by a food-health-care educational intervention: a randomized, controlled trial. *Food and Nutrition Bulletin*, *28*(4), 375-383.

Saadeh, R., and Benbouzid, D. (1990).

Breast-feeding and child-spacing: importance of information collection for public health policy. Bulletin of the World Health Organization, 68(5), 625.

Salariya, E. M., Easton, P. M., and Cater, J. I. (1978).

Duration of breast-feeding after early initiation and frequent feeding. The Lancet, 312(8100), 1141-1143.

Salehi, M., Kimiagar, S. M., Shahbazi, M., Mehrabi, Y., and Kolahi, A. A. (2004).

Assessing the impact of nutrition education on growth indices of Iranian nomadic children: an application of a modified beliefs, attitudes, subjective-norms and enabling-factors model. British journal of nutrition, 91(05), 779-787.

Santos, I., Victora, C. G., Martines, J., Gonçalves, H., Gigante, D. P., Valle, N. J., and Pelto, G. (2001).

Nutrition counseling increases weight gain among Brazilian children. The Journal of nutrition, 131(11), 2866-2873.

Satpathy, R., Das, D. B., and Nanda, N. C. (1995).

Knowledge of Anganwadi workers about breastfeeding. Indian pediatrics, 32, 933-933.

Scariati, P. D., Grummer-Strawn, L. M., and Fein, S. B. (1997).

A longitudinal analysis of infant morbidity and the extent of breastfeeding in the United States. Pediatrics, 99(6), e5-e5.

Schroeder D.G., Pachon H., Dearden K.A., Kwon C.B., Ha T.T., Lang T.T. *et al*. (2002)

An integrated child nutrition intervention improved growth of younger, more malnourished children in northern Viet Nam. *Food and Nutrition Bulletin*, *23*(Supplement 2), 50-58

Senarath, U., Agho, K. E., Akram, D. E. S., Godakandage, S. S., Hazir, T., Jayawickrama, H., Joshi, N., Kabir, I., Khanam, M., Patel, A., Pusdekar, Y., Roy, S,. K., Siriwadrdena, I., Tiwari, K., and Dibley, M. J. (2012).

Comparisons of complementary feeding indicators and associated factors in children aged 6–23 months across five South Asian countries. Maternal and child nutrition, 8(s1), 89-106.

Sethi, M. V., Kashyap, S., and Seth, V. (2003).

Effect of nutrition education of mothers on infant feeding practices. The Indian journal of pediatrics, 70(6), 463-466.

Shaili, V., Parul, S., Kandpal, S. D., Jayanti, S., Anurag, S., and Vipul, N. (2012).

A community based study on breastfeeding practices in a rural area of Uttarakhand. National journal of community medicine Vol 3 Issue 2.

Sharma, D., and Sharma, S. (2005).

Bottlenecks to Breastfeeding in Rural Rajasthan. Indian J Community Med, 30,155-6.

Sharma, K., and Bhargava, A. (2008).

Impact of multiple micronutrient fortified flour on growth, morbidity profile and hemoglobin levels of young children (6-36 months) in urban slums of Vadodara. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Sharma, K., and Mandlik, B. (2007).

Assessment of nutritional and non-nutritonal factors associated with undernutrition and anemia in young children (<3y) in urban slums of Vadodara. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Sharma, K., and Mishra, R. (2004),

Promoting Optimal Infant feeding practices in urban slums of Vadodara – impact of counseling. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Sharma, K., and Thakkar, J. (2008).

Impact of multiple micronutrient fortified flour on the growth, morbidity profile and hemoglobin levels of young children (6-72m) in ICDS centers of urban vadodara. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Sharma, K., and Thakur, A. (1995).

Maternal beliefs regarding diet during common childhood illnesses. Indian Pediatr. 1995 Aug;32(8):909-10

Sharma, K., Parikh, P., and Thakkar, J. (2011).

Impact of Multi Micronutrient Fortified Flour (MMF) on the Hemoglobin levels and growth of children (6 to 72 months) in ICDS centres of urban Vadodara. Indian Journal Of Maternal And Child Health. Volume 13 (4), 2011

Sharma, M., and Kanani, S. (2008).

Grandmother's influence on child care; Indian Journal of Pediatrics, Volume 73 – April, 2006.

Shi, L., and Zhang, J. (2011).

Recent evidence of the effectiveness of educational interventions for improving complementary feeding practices in developing countries. Journal of tropical pediatrics, 57(2), 91-98.

Shi, L., Zhang, J., Wang, Y., Caulfield, L. E., and Guyer, B. (2009).

Effectiveness of an educational intervention on complementary feeding practices and growth in rural China: a cluster randomised controlled trial. *Public health nutrition*, *13*(04), 556-565.

Shrimpton, R. (2003).

Growth monitoring and evaluation activities in Vietnam. Report to UNICEF.

Shrimpton, R., Victora, C. G., de Onis, M., Lima, R. C., Blössner, M., and Clugston, G. (2001).

Worldwide timing of growth faltering: implications for nutritional interventions. Pediatrics, 107(5), e75-e75.

Sikorski, J., Renfrew, M. J., Pindoria, S., and Wade, A. (2002)

Support for breastfeeding mothers. Cochrane Database Syst Rev. 2002;(1):CD001141. Review. Update in: Cochrane Database Syst Rev. 2007;(1):CD001141.

Simondon, K. B., Simondon, F., Costes, R., Delaunay, V., and Diallo, A. (2001).

Breast-feeding is associated with improved growth in length, but not weight, in rural Senegalese toddlers. The American journal of clinical nutrition, 73(5), 959-967.

Singh, B. M., and Vashist, S. (1993).

Assessment of training needs of Anganwadi workers in relation to infant feeding; Health and Population Perspectives and Issues 16(1and2):74-82, 1993

Singh, D. (2002).

A study of the Knowledge, Attitude and practices regarding care of the neonate in rural community: Thesis submitted to the Faculty of Medical Sciences, University of Delhi. 2002

Singh, K., Srivastava, P. (1992).

The effect of colostrum on infant mortality: Urban rural differentials. Health and Population 1992;15(3and4):94–100.

Sinhababu, A., Mukhopadhyay, D. K., Panja, T. K., Saren, A. B., Mandal, N. K., and Biswas, A. B. (2010).

Infant-and young child-feeding practices in Bankura district, West Bengal, India. Journal of health, population, and nutrition, 28(3), 294.

Skinner, J. D., Carruth, B. R., Moran, J., Houck, K., and Coletta, F. (1999).

Fruit juice intake is not related to children's growth. Pediatrics, 103(1), 58-64.

Smith, L. C., and Haddad, L. J. (2000).

Explaining child malnutrition in developing countries: A cross-country analysis (Vol. 111). Intl Food Policy Res Inst.

Smith, M. M., and Lifshitz, F. (1994).

Excess fruit juice consumption as a contributing factor in nonorganic failure to thrive. Pediatrics, 93(3), 438-443.

Snowden, H. M., Renfrew, M. J., Woolridge, M. W. (2001).

Treatments for breast engorgement during lactation (Cochrane Review). Cochrane Database systematic reviews 2001;2.

Sobhy, S. I., Mohame, N. A. (2004).

The effect of early initiation of breastfeeding on the amount of vaginal blood loss during the fourth stage of labor. Egypt Public health Association 2004;79(1-2):1-12.

Srivastava, N., and Sandhu, A. (2005).

Utility of creating an infant and child feeding index as a research, monitoring, evaluation and advocacy tool. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Srivastava, N., and Singh, S. (2006).

Towards Adaptation of Quantitative Aspects of WHO Guidelines on Complementary Feeding of Breastfed Children (6-23m) – Fulfilling the assessment needs. M.Sc Thesis submitted to the Department of Foods and Nutrition, The M S University of Baroda, Vadodara.

Sternin, M., Sternin, J., Marsh, D. L. (1997).

Rapid, sustained childhood malnutrition alleviation through a positive- deviance approach in rural Vietnam: preliminary findings. In: Wollinka O, et al eds. Hearth nutrition model: applications in Haiti, Viet Nam and Bangladesh. Arlington, VA: BASICS, 49-61, 1997.

Taja, V. P., Gupta, N. (2001).

Feeding practices and malnutrition in infants of Bhil tribe in Jhalva district of M.P. Ind J Nutrition and Dietetics 2001;38:160.

Taksande, A., Tiwari, S., and Kuthe, A. (2009).

Knowledge and attitudes of Anganwadi supervisor workers about infant (breastfeeding and complementary) feeding in Gondia district. Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive and Social Medicine, 34(3), 249.

Taveras, E. M., Capra, A. M., Braveman, P. A., Jensvold, N. G., Escobar, G. J., and Lieu, T. A. (2003).

Clinician support and psychosocial risk factors associated with breastfeeding discontinuation. Pediatrics, 112(1), 108-115.

Thakre, S. S., Thakre, S. B., Thakre, A. D., Golawar, S. H., More, S. M., and Humne, A. Y. (2012).

Effectiveness of the Training Course of ASHA on Infant Feeding Practices at a Rural Teaching Hospital: A Cross Sectional Study. *Journal of clinical and diagnostic research*, *6*(6), 1038-1040.

Tiwari, S., Rajeshwari, K., Bang, A., Chaturvedi, P., Kumar, V., Yadav, B., Bharadva, K., Gupta, S., Gupta, P., Shah, D., Aneja, S., Dubey, A. P., Choudhury, P., and Agarwal, R. K. (2010).

Infant And Young Child Feeding Guidelines: 2010. *Indian Pediatrics*, *47*(12), 995-1004.

UNICEF. (1985).

The State of the World's Children: A Report by United Nations Children's Fund (UNICEF), 1985.

UNICEF. (1990).

UNICEF Conceptual framework for nutrition. New York: UNICEF, 1990.

UNICEF. (2002).

Facts for Life. 3rd ed. New York, UNICEF, 2002.

UNICEF. (2007a).

Progress for Children Report – A Statistical Review December 2007

UNICEF. (2007b).

United Nations Children's Fund, State of World's Children 2008 : Child Survival

UNICEF. (2008).

Experts' consultation on growth monitoring and promotion strategies: Program guidance for a way forward recommendations from a Technical Consultation, UNICEF Headquarters New York, USA, June 16-18.

UNICEF. (2009).

Tracking Progress On child And Maternal Nutrition - A survival and Development priority; © United Nations Children's Fund (UNICEF) November 2009.

UNICEF. (2013).

Improving Child Nutrition: The achievable imperative for global progress

UNICEF/WHO. (2006).

Baby Friendly Hospital Initiative, revised, updated and expanded for integrated care, Session 4: The scientific basis for the "Ten steps to successful breastfeeding", Preliminary Version, January 2006.

UNICEF/WHO/BFHI. (2007).

Ten steps to successful Breastfeeding- UNICEF/ WHO Baby Friendly Hospital Initiative (BFHI). Initiation of breastfeeding by breast crawl. Available at http:// breastcrawl.org/10steps.shtml.

UNICEF/WHO/UNESCO/UNFPA. (1993).

Facts for life: A communication challenge, revised ed. Wallingford, UK, P and LA, 1993.

United Nations Children's Fund, World Health Organization, The World Bank. UNICEF WHO-World Bank (2012)

Joint Child Malnutrition Estimates. (UNICEF, New York; WHO, Geneva; The World Bank, Washington, DC; 2012).

United Nations (UN) (1986).

United Nations Department of Technical Co-operation for Development and Statistical Office. How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children in Household Surveys, United Nations, New York.

Vasundhara, M. K., and Harish, B. N. (1993).

Nutrition and health education through ICDS. Indian journal of maternal and child health: official publication of Indian Maternal and Child Health Association,, 4(1), 25.

Victora, C. G., Behague, D. P., Barros, F. C., Olinto, M. T. A., and Weiderpass, E. (1997).

Pacifier use and short breastfeeding duration: cause, consequence, or coincidence?. *Pediatrics*, *99*(3), 445-453.

Victora, C. G., de Onis, M., Hallal, P. C., Blössner, M., and Shrimpton, R. (2010).

Worldwide timing of growth faltering: revisiting implications for interventions. Pediatrics, 125(3), e473-e480.

Vitolo, M. R., Bortolini, G. A., Feldens, C. A., and Drachler Mde, L. (2005).

Impactos da implementação dos dez passos da alimentação saudável para crianças: ensaio de campo randomizado [Impacts of the 10 Steps to Healthy Feeding in Infants: a randomized field trial]. *Cad Saúde Pública*, *21*, 1448-1457.

Von Kries, R., Koletzko, B., Sauerwald, T., Von Mutius, E., Barnert, D., Grunert, V., and Von Voss, H. (1999).

Breastfeeding and obesity: cross sectional study. BMJ: British Medical Journal, 319(7203), 147.

WHO/CAH (2000)

WHO Technical Consultation on Infant and Young Child Feeding, Themes, Discussion and Recommendations, WHO, Geneva, 13-17 March, 2000. Geneva, World Health Organization, 2000 (WHO/NHD/00.8, WHO/FCH/CAH/00.22).

WHO/PAHO (2003)

WHO/PAHO. Guiding principles for complementary feeding of the breastfed child. Washington, DC, Pan American Health Organization, 2003.

WHO/UNICEF (1998)

Complementary feeding of young children in developing countries: a review of current scientific knowledge. Geneva: World Health Organization, WHO/NUT/98.1, 1998.

WHO/UNICEF (2006)

Infant and young child feeding counseling – an integrated course. World Health Organization, UNICEF, 2006.

WHO/UNICEF. (2003)

Global strategy for Infant and Young Child Feeding, Geneva, WHO 2003.

Woolridge MW (1986)

The 'anatomy' of infant sucking. Midwifery 1986, 2:164-171.

Woolridge, M. W. (1986).

The 'anatomy'of infant sucking. Midwifery, 2(4), 164-171.

World Bank. (2004a)

Attaining the Millennium Development Goals in India: How likely and what will it take to reduce infant mortality, child malnutrition, gender disparities and hunger-poverty and to increase school enrollment and completion. Washington DC: World Bank

World Health Assembly Resolution. (2001)

Infant and young child nutrition. WHA 54.2, 18 May 2001.

World Health Assembly Resolution. (2001).

Infant and young child nutrition. WHA 54.2, 18 May 2001.

World Health Organisation (2004a).

The World Health Report Geneva.

World Health Organisation (2004b).

Meeting the MDG Drinking Water and Sanitation Target, A Mid-Term Assessment of Progress 2004; World Health Organisation: Geneva.

World Health Organisation. (1991).

Indicators for assessing breastfeeding practices. Geneva, World Health Organization, 1991 (WHO/CDD/SER/91.14).

World Health Organisation. (1993).

Breast-feeding: the Technical Basis and Recommendations for Action Geneva, World Health Organization, pp.:62-74, 1993.

World Health Organisation. (1995).

Infant feeding recommendations - Weekly epidemiological report. 17 : WHO, 1995, Vol. 70, pp. 119-120.

World Health Organisation. (1997a).

Breastfeeding and the use of water and teas. Division of Child Health and Development Update No. 9, Geneva, World Health Organization, reissued, Nov. 1997.

World Health Organisation. (1997b).

Integrated management of childhood illness: chartbook and training modules. Geneva, World Health Organization, 1997 (WHO/CHD/97.3 A–K).

World Health Organisation. (1998a).

Complementary feeding of young children in developing countries: a review of current scientific knowledge (WHO/NUT/98.1). Geneva: World Health Organization, 1998.

World Health Organisation. (1998b).

World Health Organization: Evidence for the Ten Steps to Successful Breastfeeding. Geneva; 1998.

World Health Organisation. (2001a).

Global strategy for infant and young child feeding. WHA55/2002/REC/1, Annex 2. WHO. The optimal duration of exclusive breastfeeding: a systematic review. Geneva: World Health Organization. WHO/NHD/01.08;WHO/ FCH/CAH/01.23, 2001.

World Health Organisation. (2001b).

Integrated management of childhood illness: model chapter for textbooks. Geneva, World Health Organization, 2001.

World Health Organisation. (2002).

World Health Organization. Infant and Young Child Nutrition. c2002. Available from: http://apps.who.int/gb/archive/pdf_files/WHA55/ea5515.pdf.

World Health Organisation. (2003a).

World Health Organization and LINKAGES. Community-based Strategies for Breastfeeding Promotion and Support in Developing Countries.

World Health Organisation. (2005).

Guiding principles for feeding non-breastfed children 6-24 months of age. *Geneva: World Health Organization*

World Health Organisation. (2007)

Community-Based Management Of Severe Acute Malnutrition - A Joint Statement by the World Health Organization, the World Food Programme, the United Nations System Standing Committee on Nutrition and the United Nations Children's Fund , May 2007s

World Health Organisation. (2008)

Indicators for assessing infant and young child feeding practices. Conclusions of a consensus meeting held 6–8 November 2007 in Washington, DC, USA. Part 1: Definitions. Geneva: WHO.

World Health Organisation. (2009)

Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals, World Health Organization 2009.

World Health Organisation. (2010)

Indicators for assessing infant and young child feeding practices - Part 2

Wright, C. M., Parkinson, K. N., and Drewett, R. F. (2006).

How does maternal and child feeding behavior relate to weight gain and failure to thrive? Data from a prospective birth cohort. *Pediatrics*, *117*(4), 1262-1269.

Yadav, R. J., and Singh, P. (2004).

Knowledge, attitude and practices of mothers about breast-feeding in Bihar. Indian journal of community medicine, 29(3), 130-1.

Yamauchi, Y., and Yamanouchi, I. (1990).

Breast-feeding frequency during the first 24 hours after birth in full-term neonates. Pediatrics, 86(2), 171-175.

Zeitlin, M. F., Ghassemi, H., Mansour, M., Levine, R. A., Dillanneva, M., Carballo, M., and Sockalingam, S. (1990).

Positive deviance in child nutrition: with emphasis on psychosocial and behavioural aspects and implications for development. Tokyo: United Nations University.

Zhang, J., Shi, L., Chen, D. F., Wang, J., and Wang, Y. (2013).

Effectiveness of an educational intervention to improve child feeding practices and growth in rural China: updated results at 18 months of age. *Maternal and Child Nutrition*, *9*(1), 118-129.

Ziegler, E. E., Fomon, S. J., Nelson, S. E., Rebouche, C. J., Edwards, B. B., Rogers, R. R., and Lehman, L. J. (1990).

Cow milk feeding in infancy: further observations on blood loss from the gastrointestinal tract. Journal of pediatrics, 116(1), 11-18.

Zupan, J., and Aahman, E. (2005).

Perinatal mortality for the year 2000: estimates developed by WHO. Geneva: World Health Organization.

WEBLIOGRAPHY

Tools for investigating IYCF. Breastfeeding Promotion Network of India (BPNI). Available from: URL:http://www.bpni.org/research.html. Accessed July 2009.

Initiating Breastfeeding Within 1 hour - Scientific Brief 2007. Breastfeeding Promotion Network of India (BPNI). Available from: URL:http://www.bpni.org/docments/Initiating-breastfeeding-within-1hour-scientific-brief.pdf. Accessed August 2011.

Status of Implementation of Food Schemes In Gujarat - A Report based on Field Survey in Four Districts Nov 2009-Jan 2001. Available from: URL: http://www.sccommissioners.org/Reports/Reports/Gujarat_Report_0110.pdf. Accessed on September 2012.

“Integrated Child Development Services (ICDS) Scheme". Ministry of Women and Child Development, Government of India. Available from: URL:http://wcd.nic.in/icds.htm. Accessed on April 2011.

Timely Initiation of Breastfeeding within 1st Hour of Birth - Giving the Best Chance of Life and Health! October 2007. Available from: URL:http://www.ibfanasia.org/Article/timely-ib.pdf Accessed on November 2007

http://www.gujaratindia.com

BPNI Breastfeeding Promotion Network of India (BPNI). Tools for investigating IYCF. (http://www.bpni.org/research.html, accessed July 31 2007)

ANNEXURE

Annexure 1: Semi Structured Interview Questionnaire – Children Under Two Years and Pregnant Women

	Child Line No
	Pregnant Women No
	Baseline code
	Family Details
1.	Name of the Mother/ Pregnant women
2.	Mother's Age (in complete yrs)
2.a	Mothers' age at marriage
2.b	How many children does mother have? Alive_____ Male _____ Female _____ Dead _____ Male _____ Female _____ Aborted/miscarriage
2.c	Staying in village as Daughter/ Wife/ Both
3.	Religion
4.	Caste
5.	Education status of mother
6.	Occupation of mother
7.	If employed, what is her job?
8.	How many hours does she spend working?
9.	Mother income per month? (99 if working in her own farm)
10	Family income per month? (99 if don't know/not sure)
	Drinking Water
20.	What is the main source of drinking water
21.	Where the source of drinking water?
22.	How far is the drinking water source from your house
23.	Observe whether the drinking water container is covered and kept on high platform.
24.	How do you draw drinking water from the container?
	Sanitation and Hand Washing
25.	Is there a sanitary toilet in house, courtyard or compound?
26.	If "Yes" who uses the toilet? (multiple response)
27.	If "NO" where do family members go for defecation (multiple response)
28.	How do you wash your hands? Coding:- (1) Soap and water (2) only water (3) ash and water (4) mud and water (5) Not applicable (6) Don't wash 1. Before cooking / 2. After defecation / 3. Before feeding a child/ 4. After cleaning a baby after defecation
29.	Type of salt used by household. Check all salt available and note 1. Iodized - > 15 ppm / 2. Partially iodized - < 15 ppm / 3. Non iodized – 0 ppm
ANC, NC and PNC (Children below 1 years Birth date between ___/___/_____ to ___/___/_____)	
	Details of Last Pregnancy
1.	Did you have check-up during last pregnancy?
2.	No of ANC checkups
3.	Did anybody advised/guided/counseled during pregnancy on breastfeeding?
4.	If yes, where? (multiple response)
5.	If yes, about what? (multiple response)
6.	If yes, by whom? (multiple response)
	Details of last delivery
7.	Place of delivery
8.	When did you come home after delivery?

9.	When did you come to the survey village after delivery? (Skip10,11 if home delivery)
10.	What was the mode of delivery? 1. Normal / 2. Forceps/ 3. Caesarian
11.	Was blood transfusion given during pregnancy or delivery?
12.	Did anyone visit your house within 30 days of delivery to check mother or child?
13.	Who visited (multiple response)
14.	How many times in first 30 days
15.	Did anybody explain/advise/ counseling on following after child birth? Read all options in bullets EIBF within 1 hr / Colostrum feeding / No prelacteal feed/ EBF /Positioning while breastfeeding / Attachment while breastfeeding/ How to express breast milk / Keep baby warm / KMC/ Regular growth monitoring/ Any other, specify_____ If yes, who?
IYCF, Disease profile and Growth Monitoring (Children below 2 years Birth date between ___/___/_____ to ___/___/____)	
1.	Respondent for child
2.	Full name of child
3.	Sex of the [name]?
4.	a) Date of birth of [name]?
	b) Birth order of name among live birth?
5.	Age of the [name]? (Record in complete months.)
6.	Does [name] have immunization card? **(multiple response)**
7.	Was [name] weighed at birth?
8.	If yes, what was weight? (Record wt in gms)
9.	Check Q 5 and mark: 1. Age less than 12 mo. / 2. Age 12 mo. or more (go to Q 39)
10.	Has [name] ever been breastfed?
11.	If no, why
12.	When was breastfeeding initiated after birth for [name]? (Record in hours)
13.	Was anything given to the child before starting the breastfeeding/immediately after birth?
14.	If yes, what was given (multiple response)
15.	Why did you give (multiple response)
16.	Is [name] still given breast milk?
17	Check Q 5 and mark: 1. Age less than <6 months / 2. Age >=6 months or more (go to Q 28)
18.	If yes, How many times did you breastfeed last night?
19.	How many times did you breastfeed yesterday during the day?
20.	If no, till what age was [name] breastfed?
21.	When did you start giving water to [name]? (in months)
22.	Till what age do you plan to give name exclusive breast feed not even water or other milk?
23.	Did you experience any problem during breastfeeding [name]?
24.	If yes, which of these? 1. Sore Nipple/ 2. Breast Engorgement/ 3. Cracked Nipples/ 4. Inverted Nipples 5. Breast Abscess / 6. Insufficient milk
25.	Did you stop breastfeeding or started giving supplements of other milks due to such problem?
26.	If yes, who advised to stop?
27.	Was colostrums (72 hrs) given to [name] after birth?

28.	Since this time yesterday, did [name] receive any of the following? *Read out every item and record.* a) Mothers milk / b) Vitamin or mineral supplement or medicine /c) Plain water d) Sweetened, flavored water or fruit juice or tea or infusion / e) Oral rehydration solution (ORS) / f) Tinned, powder, fresh milk or infant formula g) Gripe water or janam gutti etc. / h) Solid or semi-solid (mushy) food i) *Balbhog* / j) Any other, Specify
29.	Where you advised to give Infant milk formula to [name]? if yes, note the brand
30.	Why were you advised
31.	Who advised (multiple response)
32.	Did [name] drink anything from a bottle with a nipple since birth?
33.	What did [name] take from bottle (multiple response)
34.	Who advised (multiple response)
35.	How long did/have you been using bottle?
36.	Is mother currently giving bottle to child?
37.	Has [name] sucked on a pacifier or dummy?
38.	If yes, who advised (multiple response)
	Feeding Details
39.	Is [name] still given breast milk?
40.	At what age did [name] start receiving top milk? (Record in complete months)
41.	At what age did [name] start receiving solid, semi-solid or mushy foods? (Record in complete months)
42.	If the child [name] is taking solid/semi-solid/mushy foods, please tell How many times during the last 24 hrs? ___ How many days in last one week? __
43.	What is the consistency of food generally given to [name]
44.	How much does your child eat at one time (Recodes in spoons/ katori ml)
45.	What all did the [name] take in last 24 hrs? (Read every item andrecord)
46.	Do you add (oil/ghee/butter/ sugar/Jaggery) while cooking and/or on top before giving food to [name]?
47.	Do you ensure that you child wash hand before eating?
48.	If yes, with what does [name] wash hand before eating?
	Disease Profile
49.	Has [name] been ill in the last two weeks, that is, since __ (day) of the week? 1. Fever 2. Cough 3. Diarrhea
50.	Was blood smear recommend or taken?
51.	When [name] had an illness with cough, did she/he breathe faster than usual with short, quick breaths?
52.	When [name] had illness with cough, did you observe any chest in drawing?
53.	During this episode of diarrhea, did [name] drink any of the following? *(Read every item and record)* 1. Breast milk / 2. Home fluids e.g. SSS, yogurt etc. (specify)
54.	Were you advised to give a packet of ORS?
55.	Was [name] given ORS?
56.	Did you seek advice or treatment?
57.	Where did you seek advice or treatment?
58.	Any other illness or disability in child , specify
	Growth Monitoring
59.	Has [name] every being weighed at AWC and/or *MAMTA DAY*? (Multiple response)
60.	If no, why?
61.	When was [name] last weight [Record in complete months]
62.	Was [name] weighed last along with immunization or health checkup
63.	Check whether the weight is plotted on MAMTA card?
64.	If yes, check how many weights are plotted on card?
65.	Who plotted weight in the card?

66.	Are you aware of the health status of [name] after weighing? **probe and code** 1. Yes, health/malnourished/weak / 2. Yes weight / 3. Yes grade 4. Yes color of grade
Immunization and Micronutrient Supplementation	
	Immunization
2.	Did your child get following vaccine? 1. BCG / 2. DPT 1 / 3. DPT 2/ 4. DPT 3 / 5. OPV 1/ 6. OPV 2/ 7. OPV 3/ 8. Measles 9. DPT B / 10. Polio B If yes, in any of the above 1. From card / 2. From recall/ 3. Partial from card and recall
3.	Immunization status; 1. Fully immunized (FI) / 2. Partially immunized (PI) / 3. Un immunized (UI) / 4. Not Sure
4.	Reason for PI/UI.
	Vitamin A supplementation
5.	Was 1st dose of Vitamin A given
5.b	Check Q 5 in Form 3 and mark: 1. Age between 7-11 mo. (go to Q 8) / 2. Age >=12 mo. / 3. Age <6 months (go to next section)
6.	Vitamin A given in past six months?
7.	If No, reason/s
	IFA supplementation
8.	Has [name] received IFA from AWW or ANM in last one year
9.	Who gave
10.	How much did you receive in last one year
11.	How much did the name consume
Service Utilization - MAMATA Day and Supplementary Nutrition (Children below 2 years Birth date between ___/___/_____ to ___/___/____ and <u>Pregnant Women</u>)	
	MAMTA DAY
1.	Have you heard about *MAMTA DAY*/immunization day?
2.	Do you attend *MAMTA DAY* / Immunization day?
3.	Ask for reason for not attending?
4.	Do you know which day is *MAMTA DAY* celebrated in your area?
5.	How far is *MAMTA DAY* center from you home? (min walk)
6.	Who reminds you for attending *MAMTA DAY*? (multiple response)
7.	Did you attend last *MAMTA DAY*?
8.	Reasons for not attending last *MAMTA DAY*
	MAMTA card use
9.	Has anyone explained the <u>child care component</u> of MAMTA card? (show card)
10	Who explained? (multiple response)
11	What all are you explained in MAMTA card? (multiple response)
12.	Does the mother understand growth chart on MAMTA card? Show card and ask 1. Colors / 2. Grade / 3. Growth curve / 4. IYCF messages
13	Do you refer the feeding guidelines in MAMTA card?
	Supplementary Nutrition
14	Do you get supplementary food (snacks) for [name] from AWC - multiple response
15	Reason for not taking
16	What all items do you get?
17	How much do you get in one time (Record in ml/pieces)
18	Do you get/take it regularly
19	Did you get/take yesterday/last working day?
20	How many days did you get in last week?(6 working days)
21	Does [name] completes it fully
	Check Q 14 if answer is 1 continue else end
22	How often do you get *Balbhog*?
23	Is there any fix day for receiving *Balbhog*?

24	How many days back did you last receive *Balbhog*?
25	How many packets did you receive last time
26	Has anyone explained importance of *Balbhog*?
27	If yes, who explained?
28	Do you give *Balbhog* to your child?
29	If no, why you don't give *Balbhog*?
30	If yes,[code "99" if currently exhausted at home] How many times in a day? _____ How many days in a week? _____ How many times in last 24 hours? _____ How many days in last one week? _____
31	In what forms do you give *Balbhog* to [name]?
32	Do you find any benefit of giving AWC snacks/*Balbhog* to your child?
33	If yes, what benefit
Knowledge of Lactating mothers (Under 1 years) and PW on Breastfeeding Practices (Children below 1 years Birth date between ___/___/_____ to ___/___/_____) and Pregnant Women	
1.	Since how many months are you pregnant (record in complete months) "99" if mother is not pregnant (99 then go to Q 5)
2.	જન્મ બાદ શિશુને સ્તનપાન કેટલા સમયમાં શરુ કરાવવું જોઈએ?
3.	શિશુને શરૂવાતનુ પ્રથમ ઘટ પીળુ દૂધ – ચીક આપવું જોઈએ?
4.	જન્મ બાદ શિશુને સ્તનપાન પહેલા ગળથુથી કે કઈ ચટાડવુ જોઈએ?
5.	કેટલા સમય સુધિ બાળકને ફક્ત સ્તનપાન આપવુ જેઇઅ એટલેકે પાણી પણ નહી? probe the duration for (recode in months)
6.	ઉપરી આહાર સાથે સ્તનપાન કેટલા સમય સુધિ ચાલુ રાખવુ જોઈએ? probe the duration (recode in months)
7.	બાળકને ક્યારે, સ્તનપાન કરાવવું જોઈએ?
8.	છ મહિનાથી નાના બાળકને માતાએ રાતે અને દિવસે મળીને ઓછામા ઓછુ કેટલી વાર, સ્તનપાન કરાવવું જોઈએ
9.	એક વખત માં આશરે કેટલો સમય સ્તનપાન કરાવવું જોઈએ?
10.	જો શિશુ ધાવતા વખતે એક સ્તન છોડી દેતો શુ કરવું જોઈએ?
11.	શુ માતાએ બાળકને દરવખત અલગ અલગ સ્તનપરથી સ્તનપાન શરૂ કરવું જોઈએ?
12.	શુ પ્રથમ છ માસ સુધી ફક્ત સ્તતપાન કરવવાથી ગર્ભધારેણ અટકે છે?
13.	જો સ્તનપાન કરાવતી માતા ગર્ભધારણ કરે તો તેને સ્તનપાન ચાલુ રાખવુ જોઈએ?
14.	માતા કેવી રીતે નક્કી કરી શકે કે તેનુ દૂધ બાળક માટે પુરતુ છે?
15.	શુ સર્ગેભા કે સ્તનપાન કરાવતી માતાએ વધારે આહાર લેવો જોઈએ?
16.	શુ સ્તનપાન કરાવવા થી માતાના વજન પર કઇ અસર થાય છે?
17.	બાળકને સ્તનપાન કરાવવાના શુ ફાયદા છે?
18.	બાળકનુ વજન કેટલા સમયના અંતરે કરાવુ જોઈએ?
19.	બાળકનું વજન કરવુ જરૂરી છે?
20.	જો હા તો શા માટે?
Knowledge of Mother of Children Under 2 years on Complementary Feeding Practices (Birth date between ___/___/____ to ___/___/____)	
1.	Check age of child Form 3 Q.5 and mark 1. Age < 6 months / 2. Age >=6 to 12 mo. (go to Q 5) / 3. Age >= 12 mo. (go to Q 8)
2.	કઇ ઉમર થી બાળકને ઉપરનુ દૂધ આપી શકાય? (record in months)
3.	કઇ ઉમર થી બાળકને સ્તનપાન સિવાય ઉપરી આહાર કે પદાર્થ આપી શકાય? (record in months)
4.	શરૂઆતમાં બાળકને કેટલો ઘટ ખોરાક આપી શકાય (7 to 12 mo.)
5.	બાળકને ઉપરી આહાર કેટલીવાખત આપવો જોઈએ? 7 to 12 mo. _____13 to 24 mo. _____
6.	બાળક કઇ ઉમરથી ઘરમાં બનતો ખોરાક લઇ શકે છે? (record in months)
7.	બાળક પોતાના હાથે કઇ ઉમરથી જમી શકે? (record in months)
8.	માંદગી પછી નબળા પડેલા બાળકને ની ખોરાક સંબધી શુ કાળજી લેવી જોઈએ?
9.	બાળક જમ ત્યારે તે કેટલુ જમે છે તેનુ ધ્યાન રાખવુ જરૂરી છે?

Annexure 2: In-Depth Interview Questionnaire – AWWs and Supervisors

Combating Malnutrition among Under 2
Knowledge of AWWs and Supervisors' on GMP and IYCF

District: _____Date: _____
Name: _____Age: _____
No of years of service: _____
Name of SC/ AWW/Village/Seja: ____Name of PHC/ Ghatak: _____

IYCF training

1. Have you received any special/integrated training/orientation on Infant and Young Child feeding?

If yes, 1) Since, how long: _____2) What was the name of training: _____

2. What do you mean my optimum infant and young child feeding? List four key IYCF practices

Breastfeeding

3. Do you think breastfeeding an infant is important?
4. What are the advantages of breastfeeding an infant?
5. When should the infant be put on breastfeeding after birth? Why?
6. After caesarian – section delivery, when can breastfeeding be initiated successfully? How?
7. What is exclusive breastfeeding?
8. Whether colostrum should be given to babies? Why
9. Whether pre-lacteal feeding should be given to babies? Why?
10. How long an infant should be given only breast milk, why?
11. How often should mother breastfeed her infant?
12. What should be the frequency of breastfeeding baby in 24 hours?
13. What should be the approximate duration of breastfeeding?
14. Can a baby be breastfeed in lying down position?
15. Should mother breastfeed from both breast each time she feeds her baby?
16. Should mother start feeding the child every time from different breast? Why?
17. What are the four signs of proper positioning?
18. What are the five signs of proper attachments?
19. What are the three signs of proper suckling?
20. Should child be breastfeed during night?
21. Breastfeeding at night increases milk production?
22. What should be recommended if a mother thinks that she doesn't have enough milk in the first six months?
23. What are the two signs that mother is having enough milk?
24. What should be recommended, if the mother tested HIV positive?
25. Should mother continue to feed its baby under 6 months child even when she is pregnant again?
26. Should mother continue to feed its baby between 6 months to 2 years child even when she is pregnant again?
27. Should mother take extra diet while breastfeeding?
28. Does breastfeeding help in reducing the weight of mother?
29. In situations like cracked nipple/engorgement/ Abscess what will you recommend mother regarding feeding the child and reliving from the problem?

30. Can a mother who is sick breastfeed the baby?

- Can a mother breastfeed the baby when she is suffering from following disease? Typhoid/ Malaria / Tuberculosis / Jaundice

31. Can bottle used for feeding after boiled carefully harm child in any ways?

Complementary Feeding

32. At what age should a child first receive foods or fluids other than breast milk, Why?
33. The complementary feeding should consist of what items, why?
34. What kind (attributes) of complementary food should be given to children?
35. For how long breastfeeding should be continued with complementary feeding, why?
36. What should be the frequency, quantity and consistency of food given to child at following age?

Age	Frequency	Quantity	Consistency
6 to 12 mo.	• Three times • If not breast feed due to any reason than five times	One katori (250 ml) each time	• Mashed but thick • Finger food by 8 mo.
1 to 2 yrs	• Five times	One and half katori each time	• Family food

37. Are these appropriate foods for children 6 to 12 mo.?
38. At what age can a child begin to eat from the family pot or meal?

Diet

39. Do pregnant and lactating mothers need more diet? Why
If yes then how much and what kind?

Responsive Feeding and Psychosocial Care

40. What are the signs or actions of an infant that let caregivers know that the child is hungry?
41. What are the reasons for poor appetite in children?
42. How should the caregiver feed a child during illness?
43. How should the caregiver feed a child recovering from illness?
44. What are techniques that a caregiver can use to encourage a child to eat?
45. What happens if a child refuses completely to eat? (Forced or left alone)
46. Are these age-appropriate feeding behaviors? (1)Appropriate / Not appropriate
    1) Feeding milk to a three-month-old who has lost his mother with a cup rather than a bottle.
    2) Giving a 10-month child own bowl and spoon to eat alone
    3) Keeping a 12-month old child from touching her food and plate
    4) Talking to a 10-month-old child during meal.
    5) Showing affection to a 15 month old child while feeding, showing that he/she is loved by every one
    6) Spoon feeding and holding a cup for a 24-month-old, not allowing child to touch spoon
47. What care should be taken while feeding the child?
48. Is it important to weight child? Why?
49. How frequently a child below three years should be weight?
50. What should be done after weighing child?
51. What are five important steps for effective counseling?

Annexure 3: Training Module for AWWs

આંગણવાડી કાર્યકર માટે[12]
શિશુ અને બાળક ની આહાર પૂર્તિ
પરામર્શ પુસ્તિકા
ક્ષમતા/કૌશલ્ય વધારવાની કાર્યશિબીર
૨૫ – ૨૭ જુન ૨૦૦૯
જરોદ ઘટક
વડોદરા જીલ્લો

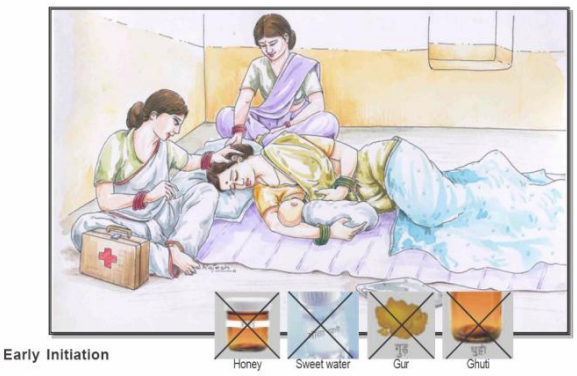
ફૂડ્ઝ અને ન્યુટ્રીશન વિભાગ
ફેમિલી અને કોમ્યુનીટી સાયન્સ
એમ.એસ યુનિવર્સિટી, વડોદરા

Translated and Developed by: -
Ms Purvi Karkar - PhD Scholar
Ms Rashmi Trivedi – Mukhya Sevika – ICDS Gujarat
Adopted from BPNI Module for frontline workers

[12] Formating changed and font reduced for annexe purpose

૧ શિશુ અને બાળક માટે સર્વોતમ આહાર શા માટે જરૂરી છે ?

કાર્યકર બહેનોએ મહિલા મંડળ તથા ગૃહ મુલાકાત દરમ્યાન પહેલાથીજ આ સીધી સીધી તથા ઉપયોગી વાતો માતા અને પરિવાર ના અન્ય સભ્યો ને કરી દેવી જોઈએ કે નવા જન્મેલા તથા નાના બાળકોને સ્તનપાન ક્યારે શરુ કરાવવુ અને કેવી રીતે.



શિશુ અને નાના બાળકો માટે સર્વોતમ આહાર એટલે કે

૧. સ્તનપાનની વહેલી શરૂઆત જન્મ ના અડધા કલાક માં.

૨. જન્મથી છ મહિના સુધી ફક્ત સ્તનપાન.

૩. ત્યાર પછી આહારપૂર્તિ માટે બાળકોને પોષણતત્વોવાળો પૂરતો સલામત અને યોગ્ય ખોરાક અને પ્રવાહી ની સાથે સાથે સ્તનપાન કરાવવાનુ ચાલુ રાખવુ.

૪. બે વર્ષ સુધી અથવા એનાથી પણ વધુ, સ્તનપાન કરાવવાનુ ચાલુ રાખવુ.

ફક્ત સ્તનપાન :

ફક્ત સ્તનપાન એટલે કે બાળકને કોઈ પણ પ્રકારનું પ્રવાહી કે ખોરાક આપવો નહી, પાણી પણ આપવું નહી. સ્તનપાનની સાથે દવા, વિટામીનના ટીપાં, પોષકતત્વો અને દવા સિવાય કઈ પણ આપવું નહિ. સ્તનમાંથી કાઢેલુ દૂધ આપી શકાય.

છ મહિના સુધી બાળકની પાણીની જરુરીયાત પણ માતાના ધાવણ માં થી પુરી થાય છે. ગરમીના મહીનામા પણ શિશુને પાણી ના આપવું જોઈએ. પાણી આપવાથી શિશુની સ્તન ચુસવાની ઈચ્છા ઓછી થઈ જાઈ છે તથા શિશુને અન્ય ચેપી રોગ જેમ કે ઝાડા ઉલટી વગેરે થઈ શકે છે.

સ્તનપાનના ફાયદા

કાર્યકર બહેનોએ માતાને સ્તનપાન તથા માતાના ધાવણના ફાયદા વિષે જરૂર થી વાત કરવી.

શિશુને થતા ફાયદા :

- માતાનુ દુધ પીવડાવાથી બાળકોનો માનસિક વિકાસ તથા વૃધ્ધિ સ્તનપાન ન કરતા બાળકો કરતા વધારે હોય છે.
- માતાના દૂધમા જરૂરી પોષક તત્વો મળે છે.
- માતાનુ દૂધમા સહેલાઈ થી પચી જાય છે તથા શિશુમા કબજિયાતની તકલીફ પણ જોવા નથી મળતી.
- સ્તનપાન કરવાવાળા બાળકોની શીખવાની તથા વાંચવાની ક્ષમતા પણ વધારે હોય છે.
- માતાનુ દૂધ ચોખ્ખુ તથા જીવાણુ રહિત હોવાના કારણે બાળકને અનેક ચેપી રોગ થી બચાવે છે વિશેષ કરીને ઝાડા તથા અતિશાર.
- માતાનુ દૂધ યોગ્ય તાપમાન વાળુ તથા જરૂર પડે ત્યારે દરેક સમયે તૈયાર મળી રહે છે.
- માતાનુ દૂધ શિશુને ાનદવાસ સબંધી સમસ્યા, એર્લજી તથા ચામડી ના રોગોથી બચાવે છે.
- માતાનુ દૂધ દમ જેવા રોગો થી પણ બચાવે છે.
- શિશુની ભાવનાત્મક જરૂરીયાત પણ પુરી કરે છે તથા માતા અને શિશુ વચ્ચે પ્રેમ ભરેલ સંબંધ બનાવે છે.

માતાને થતા ફાયદા :સ્તનપાન માતાના સ્વાસ્થને ઘણી બધી રીતે રક્ષણ આપે છે, જે સમગ્ર કુટુંબને માનસિક અને આર્થિક રીતે લાભદાયી બને છે.

- સ્તનપાન કરાવતી માતાઓમાં શારીરિક સ્થૂળતા ઓછી જોવા મળે છે. માતાઓ પહેલાના જેવું જ શરીર સ્તનપાનથી જાળવી શકે છે.
- માતાના સ્વાસ્થને ઘણી બધી રીતે રક્ષણ આપે છે.
- માતાના ગર્ભાશય ને પૂર્વ આકારમા લાવી શરીરમા લોહીની ઊણપ થી બચાવે છે.
- માત્ર સ્તનપાન ગર્ભનિરોધક જેવું કાર્ય કરે છે. જેથી માતા બીજુ ગર્ભધારણ કરવાનું વિલંબીત કરી શકે છે.
- જન્મ પછી તરત તથા વારંવાર સ્તનપાન કરાવવાથી સ્તનમાં દૂધનો ભરાવો જેવી સમસ્યા થતી નથી.
- માતા સહજ ચિંતા મુક્ત તથા પ્રસન્ન રહે છે.
- માતા બાળકને તરતજ તથા યોગ્ય તાપમાન વાળુ દૂધ આપી શકે છે જેની તેણે પૂર્વ તૈયારી

પણ કરવી પડતી નથી.

- સંપુર્ણ સ્તનપાન કરાવતી માતા શિશુ ના પાલન પોષણ તથા તેના અન્ય વ્યવહાર માટે વધારે તાલમેળ બેસાડવામા સક્ષમ તથા નિપુણ બની જાય છે.

કુટુંબ તથા સમાજને થતા ફાયદા :

- શિશુ તથા માતાના મૃત્યુ ની શક્યતા ઓછી કરે છે.
- સ્તનપાન આર્થિક રીતે પરવડે છે.
- સ્તનપાન કરતા બાળક બિમાર ઓછુ પડે છે જેથી કુટુંબ પર તેનો આર્થિક બોજો ઓછો થાય છે.
- સ્તનપાનથી કૌટુંબિક ભાવના વધે છે.

સ્તનપાનની વહેલી શરૂઆત :

બાળક સફળતાપૂર્વક સ્તનપાન કરે તે માટે વહેલામા વહેલી તકે ધવડાવવાની શરૂઆત કરાવવી એ ખૂબ જ અગત્યનું છે. જે બાળકને હુફ આપી ધાવણ જલ્દી આવવામાં મદદરૂપ બને છે. પ્રસુતિ પછીના એક કલાકમાં બાળક સામાન્ય રીતે ખૂબ જ ચપળ અને પ્રતિભાવ આપે છે અને બાળક સ્તનને વળગીને સહેલાઈથી ચૂસવા તૈયાર હોય છે. સ્તનપાનની વહેલી શરૂઆત કરવાથી બાળકને પ્રથમ ધાવણ (કોલોસ્ટ્રોમ) ના તમામ ફાયદા મળી રહે છે.

-:તમે માતાને શિશુ ના જન્મ પછી તરતજ સ્તનપાન કરાવવાની સલાહ આપજોઃ-

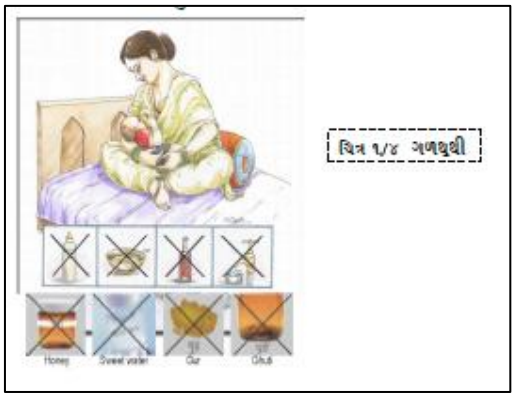
કરાટું (કોલોસ્ટ્રમ) શુ છે?

આ શરુવાતમા આવતું પ્રથમ પીળુ તથા જાડું દૂધ છે. આ માતા ના સ્તનમાં બાળકના જન્મની સાથેજ બનવાનુ શરૂ થઈ જાય છે. આ પહેલા થોડાક દિવસ સુધી ખુબજ ઓછી માત્રામાં આવે છે. પણ તે નવા જન્મેલા બાળકની જરૂરીયાત માટે પૂરતુ હોય છે. આ શિશુના જન્મના ૩ થી ૪ દિવસ આવે છે ત્યાર બાદ સામાન્ય દૂધમા બદલી જાય છે. કરાટું ખૂબ ફાયદાકારક છે.

યાદ રાખો : કોલોસ્ટ્રમ શિશુ માટે ખુબજ જરૂરી છે. તે શિશુનું પ્રથમ રસીકરણ છે.

કરાટુંના ફાયદા નીચે મુજબ છે :

- તે શિશુ માટે પ્રથમ રસીકરણ છે.
- આમા શિશુની વૃદ્ધિ માટે મદદરુપ, પુરતી માત્રામા બધાજ પોષક તત્વો છે.
- તેનાથી નવજાત બાળકના શરૂઆતનો મળ (બગાડ) જલ્દી બહાર આવે છે અને નવજાત શિશુને થતો કમળો ઓછો થાય છે.
- ચેપી રોગો તથા એલર્જી સામે રક્ષણ આપે છે.
- તેમાં વિટામીન 'એ' ખૂબ હોવાથી ચેપ સામે રક્ષણ મળે છે.
- આ નવા જન્મેલા બાળકને પોલિયાથી બચાવવામાં મદદ કરે છે.



ચિત્ર ૧/૪ ગળથૂથી

ગળથૂથી

બાળકને સ્તનપાનની શરૂઆત કરાવતાં પહેલાં આપવામાં આવતા કોઈપણ દ્રાવણતે ગળથૂથી કહેવાયમાં આવે છે. આ ખાંડ, મધ, પાણી, ગ્લુકોઝનુ પાણી વગેરે કંઈ પણ હોઈ શકે. બાળકના જન્મ પછીની બે થી ત્રણ દિવસોમાં ગળથૂથી આપવામાં આવે છે. કેટલાંક લોકો 'સૂવાનું પાણી' કે 'અજમાનુ પાણી' આપતા હોય છે જે આપવું જોઈએ નહી.

ગળથૂથી આપવાથી નવજાત બાળકને ચેપ લાગવાનો ભય રહે છે અને બાળક સફળતાપૂર્વક સ્તનપાનની શરૂઆત કરી શકતું નથી. શિશુને માતાના પ્રથમ ધાવણ કોલોસ્ટ્રમનો ફાયદો મળી શકતો નથી. નવજાત બાળક સ્તનપાન કરવાનુ શરૂઆત કરે ત્યાંથી છ મહિના સુધી પતાસા, ગોળ, ગુટ્ટી, મધ, ગળી વસ્તુ કે પાણી વગેરે જેવી કોઈ પણ પ્રકારની વસ્તુ કે પ્રવાહી આપવું જોઈએ નહીં.

સમયસર પુરક ખોરાકની શરૂઆત :

છ મહિના પછી સ્તનપાન ઉપરાંત પૂરક આહાર એટલે અન્ય ખોરાક અને અન્ય પ્રવાહી. છ મહિનાથી ઉપરના બાળકની પોષણ સંબંધી જરૂરિયાતો ફક્ત સ્તનપાનથી જ પૂરી થતી ન હોવાથી બાળકની વધારાની જરૂરિયાતો સંતોષવા માટે સ્તનપાનની સાથે-સાથે ઉપરનો પ્રવાહી ખોરાક પણ આપવો જોઈએ.

યોગ્ય પૂરક ખોરાકના લાભ :

- ક્ષતિ રહીત વૃધ્ધિ.
- પોષણતત્વોની ઉણપથી થતા જોખમોને ઓછા કરે છે.
- બિમારીઓના જોખમને ઘટાડે છે.
- યોગ્ય વિકાસ સાધવામાં મદદરૂપ બને છે.

બીજા વર્ષમાં સ્તનપાન

શરૂઆતના છ મહિના દરમ્યાન ફક્ત સ્તનપાનથી બાળકને જરૂરિયાત મુજબના પોષકતત્વો અને પાણી મળી રહે છે. તદઉપરાંત બે વર્ષની ઉંમર સુધી અને ઉપરાંત સ્તનપાન શક્તિ અને ગુણવતા ધરાવતા પોષકતત્વોનો અગત્યનો સ્ત્રોત બની રહે છે.તે બાળકની જરૂરિયાત કરતાં લગભગ ૧/૩ ભાગ જેટલુ પુરુ પાડે છે. બાળકની જરૂરિયાત મુજબ આશરે ૪૫ ટકા જેટલું વિટામીન - 'એ' સ્તનપાનથી મળે છે. સ્તનપાનથી રંતાધળાપણુ થતુ અટકાવી શકાય છે.

આમ, ધાવણથી બાળકને બીજા વર્ષ દરમ્યાન જરૂરી શક્તિ અને ઊંચી ગુણવત્તાવાળા પોષકતત્વો મળી રહે છે. ઘરગથ્થુ ખોરાકમાંથી આ પોષકતત્વો સરળતાથી મળી શકતા નથી. બીજા વર્ષ દરમ્યાન પણ ધાવણ આપવાનુ ચાલુ રાખવાથી કુપોષણ અટકાવી શકાય છે.

કૃત્રિમ આહારપૂર્તિ અને બોટલથી અહારપૂર્તિના જોખમો :

- ઘણી માતાઓ બાળકને છ મહિના પહેલા અન્ય દુધ અથવા આહાર આપવાનું શરુ કરી દે છે.
- કૃત્રિમ આહાર કેળવાતા વાત્સલ્યના સંબંધોમા અવરોધરૂપ બને છે. માતા અને બાળક વચ્ચે આત્મીય અને મમતાપૂર્ણ સંબંધ બંધાતો નથી.
- ઉપરી આહાર આપવાથી ઝાડા (અતિસાર), ન્યુમોનિયા, ઓરી - અછબડા અને અન્ય ચેપી રોગોનો ભોગ બાળક બને છે અને તેના બિમાર પડવાની શક્યતાઓ વધે છે.
- બાળકને સપ્રમાણ પોષકતત્વો મળતાં નથી અનેતે કુપોષણનો ભોગ બનવાની શક્યતા વધે છે.
- બાળકને મળતા ખોરાકમાં દૂધનુ પ્રમાણ ઓછું હોવાથી, પોષણ ઓછુ મળવાથી તેમજ તે પાતળુ હોવાથી સરળતાથી કુપોષણનો ભોગ બને છે. બાળક વિટામિન - 'એ' ની ઉણપનો ભોગ જલ્દીથી બને છે.
- જેમને કૃત્રિમ રીતે આહાર આપવામાં આવે છે એવાં બાળકો સ્તનપાન કરતા બાળકોની તુલનામાં ચેપો અને કુપોષણને કારણે મરણ પામવાની સંભાવનાઓ વધુ રહે છે.
- બાળક પશુઓના દૂધને પચાવી શકતુ નથી અને તેથી તેને ઝાડા, ચાઠા અને અન્ય તકલીફો થાય છે.
- ડાયાબીટીસ, હાઈપર ટેન્શન જેવાં કેટલાંક હઠીલા રોગોનું જોખમ બાળક મોટું થાય ત્યારે વધી જાય છે.
- વધુ પડતા કૃત્રિમ દૂધ પીતા બાળકમાં સ્થૂળકાય બની જવાની સંભાવના રહે છે.
- આવા બાળકનો માનસિક વિકાસ સારી રીતે થતો નથી અને તેનો બુધ્ધિ આંક ઓછો જોવા મળે છે.
- સ્તનપાન ન કરાવતી માતા ફરી ઝડપથી ગર્ભવતી બનવાની સંભાવના રહે છે.
- આવી માતાઓને પાછળથી ગર્ભાશય અને સ્તનનું કેન્સર થવાની સંભાવના વધૂ રહે છે.

આમ બાળકને કૃત્રિમ દૂધ આપવું એ માતા અને બાળક બંને માટે હાનિકારક છે. બાળકના આરોગ્ય અને ઉતમ જીવન માટે સ્તનપાન પાયાની જરૂરિયાત છે અને સ્ત્રીઓના આરોગ્ય માટે તે મહત્વનુ છે.

મુખ્ય સંદેશ

- સ્તનપાનની શરૂઆત જન્મના અડધો કલાકની અંદર કરવી
- જન્મના ૬ મહિના સુધી વિશિષ્ટ રૂપે માત્ર સ્તનપાનનું જ આચરણ કરવું
- ૬ મહિનાની વય પછી યોગ્ય ઉપરી આહાર આપવાનું ચાલું કરવું
- સ્તનપાન ૨ વર્ષ સુધી અને એના પછી પણ ચાલું રાખો.
- એચ.આઈ.વી. પોઝિટિવ માતાને તેમને યોગ્ય લાગે તે શિશુ આહારપૂર્તિ વિકલ્પની પસંદગી કરવામાં સલાહ આપવી અને તેમણે લીધેલા નિર્ણયને સહકાર આપવો

  સ્તનપાન શરૂ કરવા માટે સગર્ભાને ૭ માં તથા ૮ માં મહિનામાજ સમજણ આપવાની શરૂઆત કરવી તથા સાથે તેના પરિવાના વડીલ તથા અન્ય સભ્યો સંપર્ક કરી સ્તનપાનનું મહત્વ તથા લાભ સમજાવવા જરૂરી છે જેથી સ્તનપાનની શરૂઆત કરવામાં કોઈ પ્રકારની બાધા કે અડચણ ના આવે.

૨ દૂધ કેવી રીતે બને છે તથા ઉતરે છે

દરેક માતાને સ્તનના બધા ભાગ વિશે જાણકારી હોવી જોઈએ. આ જણકારી માતાને સ્તનપાન કરવવામાં મદદ રૂપ થાય છે. દૂધ કઈ રીતે બને છે, કેવી રીતે તેને વધારે પ્રમાણમાં બનાવી શકાય છે, વગેરે વિષે કાર્યકરબેન ગર્ભાવસ્થા દરમ્યાનજ માતાને જણકારી આપી શકે છે.

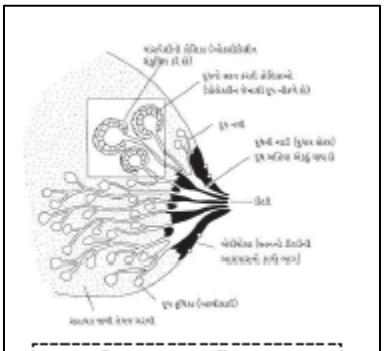
સ્તનના અલગ અલગ ભાગની રચના ને દેખાડાવા માટે પરામર્શ પુસ્તિકાનો ઉપયો કરવોઃ

સ્તનના અલગ-અલગ ભાગની રચના આ પ્રમાણે છે :

ડીંટડી - સ્તન નો એ ભાગ જેમા દૂધ નિકળીને બહાર આવે છે. જેમાં નાના નાના છિદ્ર હોય છે એ ડીંટડી કહેવાય છે. જ્યારે બાળક ડીંટડી ચુસે છે ત્યારે માતાના મગજમાં જરૂરી સંદેશ જવા માંડે છે. જેથી દૂધનું ઉત્પાદન શરૂ થઈ જાય છે.

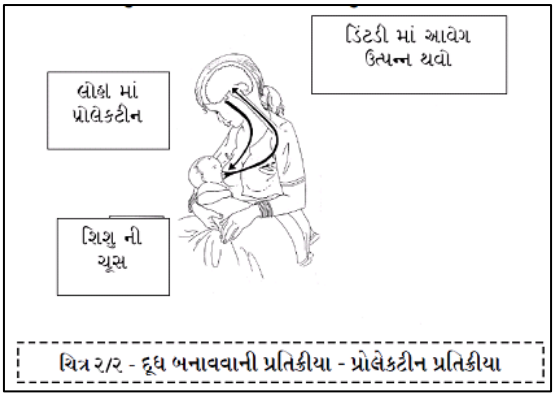
એરોલા - ડીંટડી ની આસ પાસ જે ઘેરો કાળો રંગ નો ભાગ હોય છે તે એરોલા અથવા એરીઓલા કહેવાય છે. અહિયા દૂધ કોસોમાંથી નિકળી. નળી ધ્વારા આવી ભેગુ થાય છે. એના નીચે નાની નાની મોટાગોમરી નામની ગ્રંથી હોય છે જે તૈલ્ય પદાર્થ ઉત્પન્ન કરે છે. અને ચામડી ને સ્વસ્થ રાખે છે.

દૂધ બનાવતી કોશીકાઓને સમૂહ - સ્તનમાં દૂધ બનાવવા કરોડો કોશીકાઓ હોય છે. અલગ - અલગ આકાર ના સ્તનોમાં આની સંખ્યા એક સમાન હોય છે. અહિયા ચિત્રમાં થોડા પ્રમાણમાં બતાવવામાં આવી છે. સ્તન ના ચિત્ર માં બનેલા બોક્સમાં આને મોટા આકારમાં બતાવવામાં આવી છે. એક અંતસ્ત્રાવ ઓકસીટોસીન આ કોશીકાઓને દૂધ બનાવવા યોગ્ય કરે છે. બિજો અંતસ્ત્રાવ પ્રોલેકટીન દૂધ બહાર



ચિત્ર ૨/૧ સ્તનની રચના

નિકાળવામાં મદદ કરે છે.
દૂધ બનાવતી કોશિકાઓ ની આજુ બાજુ સહાયક જાળી તથા ચરબી હોય છે. આ ચરબી તથા જાળી સ્તનને આકાર આપે છે તથા સ્તનને મોટા તથા નાના બનાવે છે સ્તનના આકાર નાનો હોય કે મોટો બન્ને દૂધ પુરતા પ્રમાણમાં બનાવે છે.



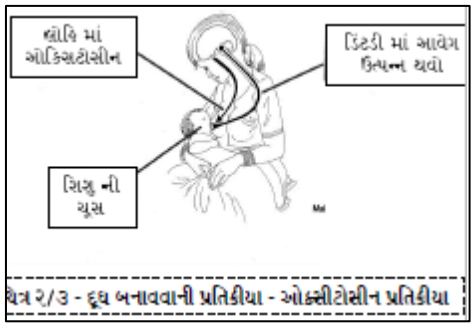
ચિત્ર ૨/૨ - દૂધ બનાવવાની પ્રતિક્રીયા - પ્રોલેકટીન પ્રતિક્રીયા

દૂધ બનાવવાની પ્રતિક્રીયા - પ્રોલેકટીન પ્રતિક્રીયા (ચિત્ર ૨/૨)
બાળકની ચુસવાની ક્રિયાને લીધે, ડીંટડીની આસપાસના જ્ઞાનતંતુઓના છેડા ઉત્તેજીત થાય છે અને મગજમાં સંદેશાઓ મોકલે છે. જેથી પ્રોલેકટીનનો અંતઃસ્ત્રાવ પોતાનું કામ શરુ કરે છે અને સ્તનને દૂધ નિકાળવા લાયક બનાવે છે.
દૂધ બનાવતા તત્ત્વો સંબંધી યાદ રાખવા યોગ્ય ખાસ વાતોઃ

૧. રાત્રિ દરમિયાન દૂધ બનાવતા અંતઃસ્ત્રાવ વધારે બને છે. જેથી રાતના શિશુ ને દૂધ પિવડાવવાથી દૂધ નીરંતર બનવામાં મદદ રૂપ થાય છે.
૨. પ્રોલેકટીન અંતઃસ્ત્રાવ થી માતાને આરામ મળે છે અને નિંદર પણ આવે છે. જેથી જ્યારે તે બાળકને રાત્રે દૂધ પિવડાવે છે તો તેને આરામ મળે છે.
૩. આથી બીજ બનવામાં મોડું થાય છે જેથી ગર્ભધારણ મોડુ કરવામાં મદદ થાય છે.

સંદેશ :બાળક જેટલુ વધારે સ્તનપાન કરે, તેટલું વધારે દૂધ બને છે. જો તે સ્તનથી દૂધ પિવાનું બંધ કરી દે, તો સ્તન દૂધ બનાવવાનું બંધ કરી દે છે.

દૂધ બહાર નિકળવાની પ્રતિક્રીયા - ઓક્સીટોસીન પ્રતિક્રીયા(ચિત્ર ૨/૩)
દૂધ નિકળવાને નિયંત્રણ ઓક્સિટીસીન અંતઃસ્ત્રાવ કરે છે. જેને માસપેશી તથા કોશિકાઓ બનાવે છે. જેથી કૃપિયોમાં એકત્ર દૂધ નળિયો તરફ વહે છે, અને જ્યારે શિશુ સ્તનપાન કરવાનું શરુ કરે છે ત્યારે આ પ્રતિક્રીયા દૂધ શિશુ ના મોઢામાં પ્રવાહીત કરે છે.
ઓક્સીટોસીનની ક્રિયામાં મદદરૂપ થતાં તથા અવરોધક પરિબળો :
આ પ્રતિક્રીયા ત્યારે પણ કામ કરે છે જ્યારે માતા બાળક વિષે વિચારે, જોવે તથા અવાજ સાંભળે છે, અને જ્યારે માતા ખુશ હોય છે કે આત્મવિશ્વાસથી ભરપુર હોય છે ત્યારે વધારે સરસ કામ કરે છે. જો આ પ્રતિક્રીયા સરખુ કામ ના કરી શકે અથવા માતા કોઈ પ્રકારની ચિંતા. પિડા કે દુખઃમાં હોય તો શિશુને દૂધ મેળવવામાં તકલીફ આવી શકે છે. દૂધ બનતુ રહે છે પણ બહાર નથી આવતુ.
જો સ્તનપાનથી દૂધ બહાર નિકાળવામાં ન આવે તો સ્તનમાં દૂધ બનતુ બંધ થઈ જાય છે. એટલે તે મહત્ત્વનું છે કે જો શિશુ દૂધ નહિ ચુસી શકે તો સ્તનમાંથી દૂધ હાથ થી નિકાળવામાં આવે જેથી દૂધ બનતું રહે.



ચિત્ર ૨/૩ - દૂધ બનાવવાની પ્રતિક્રીયા - ઓક્સીટોસીન પ્રતિક્રીયા

- બાળકની નજીક હોવું તેનો વિચાર કરવો. તેનો અવાજ સાંભળાવો કે તે નજર સમક્ષ હોવું અને માતાનો આત્મવિશ્વાસ, આ બધું જ આ ક્રિયાને ઉપકારક છે તથા તે દૂધનો પ્રવાહ વધારે છે.
- જ્યારે ચિંતા, માનસિક ખેંચતાણ કે આઘાત, શારીરીક દુખાવો વિગેરે આ ક્રિયાને અવરોધક છે અને દૂધનો પ્રવાહ ઘટાડે છે.

મુખ્ય સંદેશ
૧. શિશુનું ચુસવું દૂધ ઉત્પાદનને તથા નિકાળવાને નિયંત્રણ કરે છે.
૨. શિશુનું ચુસવું સ્તનને વધારે દૂધ બનાવવા માટે યોગ્ય બનાવે છે.
૩. જો શિશુ ચુસી ના શકે અથવા માતા સ્તનપાન કરાવી ના શકે તો નિયમીત દૂધ હાથથી નિકાળવાથી દૂધ ઉત્પાદન માં મદદ મળે છે.
૪. સ્તનપાન ન ચિંતા, ભય થી દુર તથા સારી રીતે દૂધ બનવા માટે મન ની શાંત અવસ્થા મહત્વપૂર્ણ છે.

સંદેશઃજો તમે તમારે બાળક વિષે પ્રેમથી વિચારો છો તેનો અવાજ સાંભળો છો તથા તેની સાથે રહેવામાં સંતુષ્ટિ અનુભવો છો. તો આ બધી સારી ભાવનાઓથી માતા ને દૂધ બનાવવામાં તથા ઉતરવામાં મદદ થાય છે

૩ સ્તનપાનનું મુલ્યાંકન તથા નિરીક્ષણ

કોઈ પણ માતાને સ્તનપાન તથા આહર પૂરતી વિષે મદદ કરતા પહેલા અત્યંત મહત્વપૂર્ણ છે કે તે શિશુને સ્તનપાન તથા આહાર પૂર્તી કેવી રીતે કરાવે છે તેનું નિરીક્ષણ કરવામાં આવે. બાળકના જન્મ પછી તરત પ્રથમ ગૃહ મુલાકાત દરમ્યાન, તથા ત્યારબાદ ની મુલાકાત દરમ્યાન તથા જ્યારે પણ માતા તેની પાસે મદદ લેવા આવે ત્યારે કાર્યકરે આઈ એમ.એન.સી.આઈ મુજબ નિરીક્ષણ કરવું જોઈએ.

સ્તનપાન નું નિરીક્ષણ :
કાર્યકરબેને માતાનું સ્તનપાન કરતા ઓછા માં ઓછું ચાર મિનીટ નિરીક્ષણ કરવું

૧	સ્તનપાન યોગ્ય રીતે તથા સારુ ચાલી રહ્યુ છે	૨	સંભવિત તકલીફ

- માતા એ શિશુ ને પોતાનાથી નજીક પકડયું છે, તેનું મોઢું સ્તન તરફ છે તથા શિશુના ખભા અને શરીર સીધુ છે	- શિશુ ની ડોક વાકી અથવા વળેલી છે
- માતાએ પોતાના આખા સ્તનને પકડયુ છે	- માતાએ પોતાના સ્તનને બે આંગણી વચ્ચે પકડયું છે
- માતા સીધી બેઠી છે અથવા સૂતી છે	- માતા શિશુ ઉપર આવી રહી છે
- શિશુ માતાના સ્તનની નીચે છે	- શિશુ માતાના સ્તનની ઉપર છે
શું શિશુ માતા ના સ્તન સાથે યોગ્ય રીતે વળગેલું છે	
- શિશુ ની મ્હોફાડ પહોળી છે - શિશુ એ પુરતી માત્રામાં સ્તનને મોઢામા ભરયુ છે - એરીઓલા - કાળી ચામડી મોઢાની અંદર છે - માતાના સ્તનની દશા કેવી છે ? - માતા સ્તનપાન કરાવતા કેવું મહેસુસ કરે છે - માતા પ્રસન્ન છે	- શિશુ ની મ્હોફાડ પહોળી નથી - શિશુ ખાલી ડીંટડી ચુસે છે - એરીઓલા - કાળી ચામડી મોઢાની બહાર છે - માતાની ડીંટડી નાની, અંનદર ખુચેલી અથવા બહુ મોટી છે - માતાના સ્તન બહુ કઠણ અથવા નરમ છે - માતાના સ્તન માં લાલાશ અથવા ગાઠ છે - માતાને સ્તનપાન વખતે દુઃખાવો થાય છે - માતા ચિંતીત છે

ચિત્ર ૧ માં માતા અને શિશુ વચ્ચે સ્તનપાન ઉત્તમ ચાલી રહ્યુ છે, જ્યારે ચિત્ર ૨ માં તકલીફ જોવા મળે છે. આવી માતાઓને મદદ ની જરૂર હોય છે.
નીચે ના ચિત્ર જુઓ અને તેને વધારે સ્પષ્ટ રીતે સમજો

સંદેશઃ શિશુના મોઢામાં આખુ સ્તન આપવું, ખાલી ડિંટડી નહિ

૪ સાંભળવું તથા શીખવું

પરામર્શ આપવુ એવા લોકો સાથે કામ કરવા માટે નો રસ્તો છે જેને તમે જાણો છો અને તેઓ કેવું અનુભવ કરે છે તે તમે સમજી શકો છો તેમજ તેમણે શુ કરવુ જોઈએ તે નિર્ણય લેવામાં તમે તેમને મદદ રુપ થઈ શકો છો. દૂધ પિવડાવવુ એક એવી સ્થિતિ છે જેમા પરામર્શ ની જરૂર પડે છે.
પરામર્સ ની આવડત ત્યારે ઉપયોગી થાય છે જ્યારે તમે માતાઓ સાથે વિભિન્ન તબક્કામાં વાત કરો છો. ખાસ કરી ને જેઓ બહુજ સરમાળ હોય છે કે જેઓ ને કશીજ ખબર હોતિ નથી. તમારી પાસે તેમની વાતો સાંભળવાની આવડત હોવી જોઈએ તથા તેને તમારી વાતમાં રૂચી લેવડાવવાની છે. આ બધી વાતો માતાને વધારે ખુલીને વાત કરવા માટે પ્રોત્સાહિત કરે છે. આવું ભાગ્યેજ બને છે કે માતા તમારી સાથે કોઈ પણ વાતચિત માટે તૈયાર ન થાય.

૧. વાતચીત કર્યા વિના સંદેશો આપવાના ઉપાય

વાતચીત કર્યા વિના સંદેશો આપવાનો અર્થ છે કે તમારું વલણ, હાવભાવ દ્વારા, બોલ્યા વિના દર્શાવવું. વાતચીત કર્યા વિના સંદેશો આપવાના ઉપાય માતાને તેવુ સમજાવવામાં મદદ કરે છે કે તમને તેનામાં રૂચિ છે, જેથી તેને તમારી સાથે વાતકરવાથી મદદ મળે છે. વાતચીત કર્યા વિના સંદેશો આપવાના ઉપાય આ પ્રમાણે છે.

- તમે માતા સાથે તેની બાજુમાં બેસો
- જરૂર જણાય તેટલી દુરી રાખવી તેમજ અંતરાયો દુર કરવા
- ચર્ચા વખતે માતા પર ધ્યાન કેન્દ્રિત કરવું
- તેને સાંભળવા માટે પુરતો સમય આપવો
- માતા અને બાળક પ્રત્યે લાગણી પ્રદર્શિત કરવી

એક માતા પોતાના શિશુ ને સ્તનપાન કરાવવા માં કેવું મહેસુસ કરતી હોય છે ?

- શુ સ્તનપાન વખતે તેને કોઈ તકલીફ કે દુઃખાવો થાય છે ?
- શુ સ્તનપાન વખતે બાળક માતાને સહયોગ કરે છે ?
- શુ સ્તન માં સોજો કે ભરાવો છે ?
- શુ તેને સ્તનપાન વખતે બાળકને લેવાની તથા વળગાળવાની રીત વિષે કોઈની ધ્વારા સમજ કે

ચિત્ર ૩/૧ - યોગ્ય રીતે લેવાયેલ તથા પકડેલ બાળક ચિત્ર ૩/૨ - અયોગ્ય રીતે લેવાયેલ તથા પકડેલ બાળક

અ: તેને પોતાની આંગળીઓ સ્તન નીચે ટેકવી છે જેથી આંગળીઓ સ્તન નીચે સહારો આપે છે બ: તેને પોતાના સ્તનને બહુજ પાસેથી ડીંટડીની નજીક થી પકડયુ છે

ચિત્ર ૩/૩: સ્તનને પકડવાની રીત

જાણકારી મેળવેલ છે ? કોના દ્વારા જાણકારી મેળવેલ છે ?

માતા તથા બાળકની સાચી સ્થિતિ તથા બાળકને સાચી રીતે ધવડાવવું, સફળતાપૂર્વક સ્તનપાન માટે અત્યંત જરૂરી છે

૨. મુક્ત પ્રતિભાવ મળે તેવા પશ્નો પૂછવા

મુક્ત પ્રશ્નો સૌથી વધારે ઉપયોગી સાબિત થાય છે. એ પશ્નોના જવાબરૂપે, માતાએ અનિવાર્ય પણે તમને માહિતી આપવી પડે છે. આવા પ્રશ્નો સામાન્ય રીતે "શું ? કેમ? ક્યારે? શા માટે? " થી શરૂ થાય છે ?

દા.ત. "તમે તમારા બાળકને કેવી રીતે સ્તનપાન કરાવો છો ?"

બંધિયાર પ્રશ્નો સામાન્ય રીતે ઉપયોગી નિવડતા નથી. તેનાથી માતા તમને એવા જ જવાબો આપે છે, જેની તમે અપેક્ષા રાખો છો તે માત્ર 'હા' કે 'ના' માં જ જવાબ આપે છે.

બંધિયાર પ્રશ્નો સામાન્ય રીતે શું "તમે ?" અથવા "શું તેણે ?" થી શરૂ થતા હોય છે.

દા.ત. "તમે તમારા છેલ્લાં બાળકને સ્તનપાન કરાવ્યું હતું ?"

આ પ્રશ્નના જવાબમાં માતા 'હા' પાડે તો પણ તમે એ જાણી નહીં શકો કે તેણે તેના બાળકને માત્ર સ્તનપાન કરાવ્યું હતું કે નહીં અથવા તેણે તેના બાળકને અન્ય કૃત્રિમ આહાર આપ્યો હતો કે નહિ ?

વાતચીત શરૂ કરવા માટે સામાન્ય મુક્ત પ્રશ્ન મદદગાર થાય છે.

દા.ત. "તમારા પ્રમાણે બાળકને દૂધ કેવી રીતે પિવડાવવું જોઈએ ?" આ વાતચીત ચાલું રાખવા માટે તમે વધારે મુક્ત પ્રશ્નો પૂછો.

દા.ત. "બાળકના જન્મ સમયે કેટલા કલાકમાં તમે તેને પ્રથમ ધાવણ આપ્યુ હતું"

ક્યારેક તમારે કોઈ બંધિયાર પ્રશ્નો પણ પૂછવા પડે, ખાસ કરીને જ્યારે તમારે કોઈ તથ્ય સુનિશ્ચીત કરવુ હોય.

દા.ત. "તમે તને બીજો કોઈ આહાર કે પ્રવાહી આપો છો ? " અથવા "બીજો આહાર તમે બોટલથી આપો છો ?"

માતા જવાબ આપી રહે તે પછી તમે તેના અનુસંધાનમાં બીજો પ્રશ્ન પૂછી શકો

દા.ત. "તમને એવું કેમ લાગે છે ?" અથવા "એવું તમે કેમ નક્કી કર્યું ?"

૩. એવા પ્રવિભાવ અને હાવભાવ દર્શાવવા જે રૂચિ અને રચના સૂચક હોય

માતા ને વાત ચીત ચાલુ રાખવા પ્રોત્સાહીત કરવાનો એક રસ્તો એવો છે કે તમે હાવ ભાવ દ્વારા તેને બતાવો કે તેની વાતચીતમાં તમને રુચી છે

દા.ત. માતા સામે જોવું, માથુ હલાવવું અને હસવુ, અથવા "ઓહ", "એમ કે", "અચ્છા" જેવા સીધા પ્રવિભાવો આપવા.

૪. માતા જ કહે તેનો પ્રતિ ઉત્તર કરવો

પ્રતિ ઉત્તર આપવાનો અર્થ છે કે માતાએ જ તમને કહ્યુ છે, તેને થોડુ બદલીને ફરી થી કહેવું જેથી તેવું વ્યક્ત થાય કે તમે તેની વાતો ને સરખી રીતે સાંભળી જેથી તેને વધારે કહેવા માટે પ્રોત્સાહન મળે. જેમ કે જો માતા કહે " કાલે રાતે મારુ બાળક ખુબ રડતું હતુ" ત્યારે તમે એવું કહી શકો "તમારા બાળકે આખી રાત રડીને ઉધવા ન દીધા એમને ?" માતાની વાત તથા તેની સમસ્યા ને સાંભળવી જોઈએ જેથી તેની રીતે આપણે તેની સમસ્યાનો હલ કરવા તેને મદદ કરી શકીએ, તથા તેને વધુ સારી રીતે સમજાવી શકીએ.

૫. તાદાત્મ્ય સાધવું - તે શું અનુભવે અને તમે સમજો છો એવું દર્શાવો

માતાની ભાવનાઓને સમજયા પછીજ, તે સમજાવી શકશે કે તે શુ અનુભવી રહી છે.

દા.ત. કોઈ માતા કહે:

" મારું બાળક વારંવાર ધાવવા માગે છે અને એનાથી હું થાક અનુભવું છું."

એની લાગણી જાણી તમે આ રીતે પ્રતિભાવ આપી શકો;

" તમે આખો દિવસ થાક અનુભવતા હશો નહીં?"

આથી એવું પ્રતિત થાય છે કે તમે સમજી શકો છો કે તે થાક અનુભવે છે, એટલે કે તમે તેને તાદાત્મ્ય બતાવો છો.

તાદાત્મ્ય સાધ્યા વગર જો તમે વધુ હકીકતો જાણવા પ્રશ્નો પૂછો :

દા.ત. તમે પૂછી શકો કે " તમારું બાળક કેટલીવાર સ્તનપાન કરે છે ? તમે તેને બીજું શું આપો છો ? તો આવા પ્રશ્નોથી માતાને એવું નહી લાગે કે તમે તેની લાગણી સમજો છો.

૬. કોઈ પ્રકારનો અભિપ્રાય વ્યક્ત કરતા હોય એવા શબ્દોનો પ્રયોગ ટાળો.

સાચુ, ખોટુ, સારુ, ખરાબ, પૂરતુ, યોગ્ય રીતે વગેરે.

જો તમે આવા શબ્દો નો ઉપયોગ કરશો તો માતાને એવું લાગશે કે તેણે કઈ ખોટુ કર્યુ છે અથવા તેના બાળકને કઈક તકલીફ છે.

યાદ રાખો :યોગ્ય પરામર્શ સ્તનપાન વિશે વધારે માહિતી આપવા માટે મદદ રૂપ બની શકે છે

પ માતા મા વિશ્વાસ ઉભો કરવો, સહકાર આપો, અને તેની સમજણને ચકાસો

સ્તનપાન કરતી માતામાં વિશ્વાસ હોવો ખુબજ જરૂરી છે, આથી સ્તનપાનની સફળતાની સંભાવના ખુબજ વધી જાય છે. ખાસ કરીને પહેલીવાર સ્તનપાન કરાવતી માતા સહેલાઈ થી આત્મવિશ્વાસ ખોઈ દે છે. જેના પરીણામ સ્વરૂપે, તે ઘરના સંભ્યો કે મિત્રોના કહેવા પ્રમાણે ઉપરી આહાર શરૂ કરી દે છે.

એક કાર્યકર ના રૂપમાં તમારે પરામર્શ કરવાની જરૂર પડે છે, તથા તેમા તમે તમારા વ્યવહાર સમર્થન, તથા સહકાર થી વિશ્વાસ સ્થાપિત કરી શકો છો.

આવી આવડત તમારામાં ધીરે ધીરે આવશે, તથા તેણે તમે ઉપયોગ તથા અભ્યાસ ધ્વારા શિખી સકશો.

માતાઓમાં વિશ્વાસ ઉભો કરવા માટે તથા તેને પ્રોત્સાહન આપવા માટે તમે નીચે મુજબ પગલાં લઈ શકો છો.

૧. માતા જે વિચારતી, અનુભવતી હોય તથા તમને જણાવતી હોય તેને સ્વીકાર કરો

દા.ત. આ એક સમાન્ય ગેરસમજ છે.

માતા : "મારું દૂધ પાતળું અને નબળું છે, એટલે મારે બાટલીનું દૂધ આપવું પડે છે"

કાર્યકર : "ના ના, દૂધ ક્યારેય પાતળું કે નબળું ન હોય એતો એવું દેખાય"

આ અયોગ્ય પ્રતિભાવનું ઉદાહરણ છે કારણ કે કાર્યકર અસંમતિ દર્શાવે છે.

માતા : "મારું દૂધ પાતળું અને નબળું છે, એટલે મારે બાટલીનું દૂધ આપવું પડે છે."

કાયેકર : "હા, પાતળું અને નબળું દૂધ એ એક સમસ્યા બની શકે."

આ પણ અયોગ્ય પ્રતિભાવનું ઉદાહરણ છે કારણ કે સંમતિ દર્શાવે છે.

માતા : "મારું દૂધ પાતળું અને નબળું છે,એટલે મારે બાટલીનું દૂધ આપવું પડે છે."

કાર્યકર : "અચ્છા તમને તમારા દૂધ વિશે ચિંતા છે."

આ યોગ્ય પ્રતિભાવ છે, કારણકે તે માતાની ચિંતાનો સ્વીકાર કરે છે.

૨. માતા પોતાના બાળક માટે જે યોગ્ય વર્તન કરતી હોય તેને સ્વીકારો અને તેની પ્રશંસા કરો

દા.ત.

માતા કહે છે : "મારુ બાળક ૧૫ મહિનાનું થઈ ગયુ છે, તે હજુ પણ મારુ દૂધ પીવે છે, તથા રાબ, ચા અને બ્રેડ ખાય છે. "

કાર્યકર્તા ધ્વારા પ્રશંસા : "ખુબજ સારુ કહેવાય કે તમે હજુ પણ સ્તનપાન કરાવો છો, અને સાથે તેણે અન્ય આહાર પણ આપો છો."

માતા ધ્વારા કરવામાં આવતા યોગ્ય વર્તનની પ્રશંસા બધા સામે કરવાથી માતાને પ્રોત્સાહન મળે છે, અને બીજાને પ્રેરણા મળે છે. આના પછી તે સહેલાઈ થી તમારા સુચનો સ્વીકારશે.

૩. જરૂરત ના સમયે વ્યવહારુ મદદ મળવાથી માતાનો આત્મવિશ્વાસ વધે છે

દા.ત.

માતા કહે છે : "મે હજુ સુધી મારુ દૂધ નથી પીવડાવ્યુ, કેમકે હજુ મારા સ્તનમાં દૂધ નથી ઉતર્યુ, હુ ઉભિ પણ નથી થઈ શકતી અને મને દુ:ખાવો થાય છે"

કાર્યકર ધ્વારા મદદ: "આવો હુ તમને આરામ થાય તેવી સ્થિતિમા સુવડાવું, પછી તેને આરામ કરવા માટે ઓશીકુ કે ખુરશી આપવી. આ સમયે માતાને તમારી સલાહની નહી પણ તમારા સહકારની જરૂર હોય છે - તમે તેને શિશુ ને લેવામાં તથા પોતાના માટે પાણી અને ખોરાક લેવામાં મદદ કરી શકો છો.

૪. માતા ને એવી જાણકારી આપવી જે સમયના અનુરૂપ હોય અને જેતે સમયે માતાને કામ લાગે

દા.ત.

"એક નવા જન્મેલ શિશુ ની માતા જે સ્તનપાન પહેલા બાળકને અન્ય કઈ પ્રવાહી કે ગળથુથી આપવા ઈચ્છતી હોય"

કાર્યકર ધ્વારા યોગ્ય સુચન: આ ઉમરમાં શિશુને માત્ર કોલસ્ટ્રમ ની જરૂરત હોય છે, આ માહિતી પણ યોગ્ય રીતે આપવી જેથી માતાને એવુ ના લાગે કે તમે તેને ટોકો છો કે આલોચના કરો છો.

માતા ની સમજ ને પરખવી

જરૂર પરખ કરો કે તમે જે માતાને જાણકારી આપી કે મદદ કરી તે માતાએ યાદ કરી અથવા શીખી લીધી

દા.ત.

તમે નવી માતાને કોલસ્ટ્રમ વિષે જાણકારી આપી પુછી શકો છો કે "તમે તમારા શિશુ ને પહેલી વાર દૂધ પિવડાવતી વખતે શુ આપશો ?" જો તે જવાબ મા "માત્ર કોલસ્ટ્રમ" કહે તો તેની પ્રશંસા કરો.

જોતે બિજી કોઈ વસ્તુ આપવાની વાત કરે તો તેની આલોચના કર્યા વગર, પુર્વઆગ્રહ રાખ્યા વગર, કે ગુસ્સે થયા વગર ફરીથી તેની સાથે કોલસ્ટ્રમ ના મહત્ત્વ પર ચર્ચા કરવી.

૫. સરળ ભાષાનો પ્રયોગ કરવો

દા.ત

"જન્મ ના છ માસ સુધી કેવળ માતાનું દૂધ જ આપવું જોઈએ"

આની જગ્યા એ કાર્યકર આવુ કહી શકે છે કે

"શિશુને ત્યા સુધી કોઈ પ્રવાહી કે ખોરાક ની જરૂરત નથી હોતી જ્યા સુધી તે છ મહિનાનુ નથી થઈ જતું"

૬. સુચનો કરો આદેશ નહિ

દા.ત

અયોગ્ય	યોગ્ય
“ બાળકને કપ થી જ દૂધ પીવા દેવું ”	“ ઘણી માતાઓ પોતાના બાળકને કપ થી જ આહર કે દૂધ આપે છે” “તમે પણ તમારા બાળકને કપથી આહાર કે દૂધ આપો શકો છે”

નિયમીત વ્યવહાર ધ્વારા તમને નક્કી કરવામાં સરળતા રહેશે કે માતાને ક્યારે અને કેવી રીતે પરામર્શ કરવું છે.

યાદ રાખો :માતા મા વિશ્વાસ જગાવો તે સફળ સ્તનપાનની ચાવી છે.

૬ પ્રસુતિ પહેલાની તૈયારી તથા સમાજમાં સ્તનપાન અંગે સમર્થન ઉભુ કરવું

શિશુ અને બાળ આહાર અંગે સમાજમાં પ્રચલીત સાચી અને ખોટી માન્યતા તથા રિવાજનું સ્તનપાન ની સફળતા અને અસફળતા ઉપર પ્રભાવ પડે છે. સમાજ મા પ્રચલીત ખરાબ પ્રથા કે રિવાજોના ચાલતા સ્તનપપાનમાં બાધા અને કૃત્રિમ આહાર ના ઉપયોગ ના પ્રચારમાં સહાયક થાય છે.

સ્તનપાન માટે પ્રસુતિ પૂર્વ તૈયારીઓ

એક સ્ત્રી માટે ગર્ભાવસ્થા તેના જીવનનો ખુબજ મહત્વપૂણ સમય હોય છે. ગર્ભવતી સ્ત્રી એક સ્વસ્થ તથા સુરક્ષિત પણે બાળકને જન્મ ત્યારેજ આપી શકે છે જ્યારે તે પોતે સ્વસ્થ હોય. માતાઓને પ્રસુતિ પૂર્વ સ્તનપાન સંબંધી બધીજ જાણકારી આપવામાં આવે તે ખુબજ જરૂરી છે જેથી તે સ્તનપાન વિષે શિખીને ઉચિત નિર્ણય લઈ શકે છે. જેમ કે -

૧. સ્તનપાન સંબંધી માતાઓના સવાલો પર ચર્ચા કરો સ્તનપાન સંબંધી માન્યતાઓ અને ભ્રમ તથા કૃત્રિમ આહારપૂર્તી થી થતા નુકશાન અને તેને દુર કરવાના ઉપાયોની વાત કરો.
૨. સ્તનપાન શા માટે જરૂરી છે, અને કેવી રીતે શરુ કરાવવું તે સંબંધી સરળ અને યોગ્ય જાણકારી આપવી.
૩. પ્રસુતિ પછી માતા અને શિશુ ને સાથે એક રૂમ મા રાખવા. જેટલુ જલદી બની શકે તેટલુ સ્તનપાન સંબંધી ફાયદા બતાવવા. બાળક જ્યારે માંગે ત્યારે દૂધ આપવુ. શિશુ ને તેની માંગ ઉપર સ્તનપાન કરાવવુ જોઈએ.
૪. માતાઓને જણાવો કે શિશુના જન્મ પછી તરતજ તે સફળતાપુર્વક સ્તનપાન માટે પ્રતિક્રીયાશીલ તથા તૈયાર હોય છે.
૫. માતાઓને સ્તનમાંથી દૂધ કેવી રીતે નિકળે તે બતાવવું જોઈએ.
૬. માતા તથા ઘરના અન્ય સભ્યોને જણાવવુ કે શિશુ ને છ માસ સુધિ અન્ય કોઈ પ્રવાહી કે ખોરાક આપવાની જરૂરત હોતી નથી.
૭. પ્રથમ વાર બનતી માતાઓને જણાવવુ કે તેને પ્રસુતિ પછી સફળતાપૂર્વક સ્તનપાન માટે મદદની જરૂરત પડી શકે છે.

ગર્ભાવસ્થા દરમ્યાન સ્તનપાનની તૈયારી કરવાનો મુખ્ય હેતુ અટલોજ છે, કે માતાઓ વધારેને વધારે સ્તનપાન કરાવવા માટે પ્રેરિત તથા પ્રોત્સાહિત થાય અને જો કોઈ પ્રકારની સમસ્યા આવે તો તેને દૂર કરી શકાય.

સંદેશઃ ગર્ભાવસ્થા દરમ્યાન માતાઓને સ્તનપાન વિશે આપવામાં આવતી જાણકારી તેને સફળતા પૂર્વક સ્તનપાન કરાવવા માટે પ્રોત્સાહિત કરે છે

આના માટે એ જરૂરી છે કે કાર્યકર્તા તેવી માતાઓનુ ધ્યાન રાખે જે તેમના વિસ્તારમાં માતા બનવાની છે. મહિલા મંડળ મા આવી માતાઓને બોલાવી સ્તનપાનના ફાયદા વિષે બતાવવું. આના સિવાય ગૃહ મુલાકાત દરમ્યાન વ્યક્તિગત રીતે માતાની સમસ્યા વિશે સાંભળવું અને તેનુ નિરાકરણ કરી તેના ઉંપાય બતાવતા.

સ્તનપાનની શરૂઆત વખતે માતાઓને સહાયતા કરવી

ઘણા વિસ્તારોમાં શિશુના જન્મના ત્રીજા દિવસથી સ્તનપાન કરાવવામાં આવે છે, કારણકે એવો એક રિવાજ છે કે નણંદ આવી ને માતાના સ્તનને ધોવે છે, ત્યાર પછી માતાને પોતાનુ દૂધ પિવડાવવાની અનુમતી હોય છે.

કાર્યકતાઓ માટે જરૂરી છે કે તેમના વિસ્તારમાં, માતા બનનાર સ્ત્રી ના ઘરનાં બધાજ વડીલો, સાસુ, માં, દાદી, વગેરે ને સ્તનપાન માં મદદ કરવા તૈયાર કરે તથા ગેરસમજ કે અંધવિશ્વાસ દૂર કરવા માટે ઘરનાં બધાજ વડીલો ને શિક્ષિત કરવામાં વિશેષ ભુમિકા નિભાવે. આ તેનુ કાર્ય છે જે તેને સફળતા પૂર્વક નિભાવવું જોઈએ.

શિશુનાં પિતાને પણ પ્રેરીત કરવાની જરૂર હોય છે.

જો કોઈ માતાને પોતાના સ્તન ના નિપ્પલ ની બનાવટ માં કોઈ તકલીફ હોય તો તમે તેને એવું કહીને તેનામાં આત્મવિશ્વાસ ઉભો કરવો કે બધીજ માતાઓ તેના બાળકને સફળતાપૂર્વક સ્તનપાન કરાવી શકે છે.

સ્તનપાન અને અંધવિશ્વાસ

આપણા દેશમાં સ્તનપાન વિષે અનેક ખોટી માન્યતાઓ તેમજ અંધવિશ્વાસ હોય છે કાર્યકરોએ આના વિષે જાણકારી મેળવી જોઈએ તથા માતાઓ તેમજ પરિવારના અન્ય સભ્યોને તેના વિષે શિક્ષિત કરવા જોઈએ.

કોલોસ્ટ્રમ ન આપવું

આપણા દેશમાં અનેક સ્ત્રીઓ કોલસ્ટ્રમ શિશુને આપતી નથી. આથી સમાજના સભ્યોને કોલસ્ટ્રમ નાં ફાયદા વિષે માહિતગાર કરવા જરૂરી છે.

આપણે આવી ધારણા બદલવી જોઈએ તેના પરિવરના સભ્યોને જલ્દી સ્તનપાન શરૂ કરવાના ફાયદા વિષે જણાવવુ જોઈએ.

માતાના આહાર વિષે ગેરસમજણો

૧. ઘણા વિસ્તારોમાં માતાને શિશુ ના જન્મના છ દિવસ સુધી કોઈ અન્ય ખોરાક આપવામાં આવતું નથી, જે કોઈ સારો રીવાજ નથી.

૨. શિશુના જન્મ પછી માતાને વધુ માત્રામાં ઘી આપવામાં આવે છે, આ રિવાજને નકારવો જોઈએ, આથી માતા જાડી અને સ્થુળ થવા લાગે છે. માતાના ખોરાકમાં વધારે પ્રમાણમાં પ્રોટિન તેમજ લીલાશાક ભાજી હોવા જોઈએ.

૩. ઘણી માતા આ ખોટી ધારણાનેમાની લે છે કે સ્તનપાન કરાવવાથી તેના સ્તનનો આકર ઢીલો પડી જશે અને તે લટકી જશ,. આ માન્યતાને બદલવી જોઈએ. શરીરને સુડોળ બનાવી રાખવા માટે સ્તનપાન એક સર્વોત્તમ પ્રાકૃત્રિક રસ્તો છે. સગર્ભાઅવસ્થા દરમ્યાન વધેલું વજન સ્તનપાનથી જાતે ઘટી જાય છે.

યાદ રાખો :પ્રસુતિના એક કલાકની અંદર શિશુ ને માતાના સ્તન સાથે વળગાળવું, જેથી દૂધ બનવામાં તેમજ નિકળવામાં વધારો થાયે

વારંવારં પૂછાતા પ્રશ્નો

૧. સ્તનને દબાવવાથી વધારે દૂધ આવે છે.
આ માન્યતા બદલવી પડશે કારણકે આ માન્યતા ખોટી છે.

૨. જો માતા બિમાર હોય તો તે બાળકને દૂધ પિવડાવી શકતી નથી.
આ માન્યતા દૂર કરવી જોઈએ. જો માતા દૂધ પિવડાવી શકે તો તેને જરૂર આવવુ જોઈએ.માતાના ધાવણ થી બાળક બીમાર ઓછુ પડે છે અને માતાનુ ધાવણ બાળકને બિમારી થી બચાવ કરે છે.

૩. બાળક બિમાર હોય તો પણ તેને માતાનુ ધાવણ ન આપવું જોઈએ.
આવી ખોટી માન્યતા પણ દૂર કરવી જોઈએ. જ્યારે બાળક બિમાર હોય ત્યારે તેને સ્તનપાન કરાવવું વધારે જરૂરી હોય છે. જેથી બિમારી વખતે બાળકને યોગ્ય પોષણ તથા સ્વસ્થ સુધારવા માટે શક્તિ મળે છે.

૪. ઘણા બધા લોકો ખસખસ, લસણ, સુકુ નારિયેલ, જીરૂ, ફળ દૂધ વધારવામાં મદદગાર માને છે, અને સુવાવડ પછી આને ખાસ ખાય છે.
આનાથી દૂધની માત્રા વધતી નથી. જલ્દી સ્તનપાન કરાવવાથી, તથા દિવસ અને રાત્રે સ્તનપાન કરાવવાથી દૂધની માત્રા વધે છે.

૫. સ્તનપાન કરાવતી માતાને દૂધ પીવડાવવાથી વધારે દૂધ આવે છે.
સ્તનમાં દૂધ વધારે બનવું તે વધારે દૂધ લેવાથી નહી પણ વધારે સ્તન ચુસવાથી થાય છે. જેથી વધારે દૂધ આવે છે. જોકે માતાને દૂધ પીવડાવુ તે માતાના સ્વસ્થ માટે લાભ દાયક હોય છે.

૬. નાના સ્તન વધારે દૂધ નથી બનાવી શકતા
આ માન્યતા પણ ખોટી છે કારણ કે સ્તન નાના કે મોટા તેના મા કેટલી ચરબી છે તેના પર નિર્ભર હોય છે, જ્યારે દૂધ વિશેષ ગ્રંથિમા બને છે,. જે બધીજ સ્ત્રી યો માં પુરતા પ્રમાણમાં હોય છે. બધીજ માતાઓ શિશુને દૂધ પીવડાવવામાં સક્ષમ હોય છે.

૭. જો માતા પહેલા બાળકને દૂધ નહીં પીવડાવી શકી હોય તો તે બીજા બાળકને પણ દૂધ ના પીવડાવી શકે.

જો માતા પહેલા બાળકને દૂધ પીવડાવી ના શકી હોય તો પણ તે બીજા બાળકને દૂધ પીવડાવી શકે છે.

વિસ્તારમાં સ્તનપાન અંગે સમર્થન ભેગુ કરવું

દરેક ગામ અને સમાજમાં બહેનોના સમુહ હોય છે, જેમ કે મહિલા મંડલ, સ્વયં સેવક, દાયણ, આંગણવાડી કાર્યકર, હેલ્પર, લોક સ્વાસ્થ રક્ષક વગેરે. આ બધાને એકત્ર કરી, પ્રેરીત કરી, એક સ્તનપાન સમર્થન જુથ બનાવવાનો પ્રયાસ કરી શકાય.

- આ સમુહ પ્રત્યેક પહેલા અને ચોથા અઠવાડિયામાં અથવા મમતા દિવસ પર કોઈ એક સદસ્ય ના ઘરે કે સમાજમાં કોઈ નિશ્ચિત જગ્યાએ, મળી શકાય છે. અહીયા સ્તનપાન ના લાભ વિશે ચર્ચા કરવી જોઈએ.
- તેઓ પોતાના અનુભવોની આપલે કરે જેથી તેઓ એક બિજાનો પ્રોત્સાહન સાથે મદદ કરતા સ્તનપાન અંતે મુશ્કેલી થી પાર થવાના રસ્તા વિશે ચર્ચા કરે. તેઓ આના વિષે ઘણુ બધુ શિખી શકે છે.
- આ સમૂહને કોઈ એવા વ્યક્તિ ની મદદ ની જરૂર હોય છે, જે સ્તનપાન વિષે સાચી જાણકારી આપી બધાને પ્રશિકક્ષીત કરે તથા જે તેમની ભુલો સુધારે અને તેમની મુશ્કેલી નો હલ બતાવી શકે. આવી મદદ સમૂહને સમર્થન આપવામાં સહાયક હોય છે ના કે ફરીયાદ ના રૂપમાં.
- આવા સમૂહને નવીનતમ સામગ્રીની પણ જરૂર હોય છે જેથી સ્તનપાન વિષે માહિતગાર કરી શકે. આને પામવામાં આરોગ્ય કાર્યકર મદદ કરી શકે છે.
- આવા સમૂહની માતાઓ પણ એક બીજાને સમય સમય પર મદદ કરી શકે છે, નકે કેવળ મિટીગ કે સમેલન વખતે, જ્યારે તેઓ ચિંતીત કે હેરાન હોય છે ત્યારે તેઓ એક બિજાના ઘરે જઈ શકે છે, કે પછી કોઈ માહિતી ના હોય તો પુછવા જઈ શકે છે.

૭ બાળકને સ્તન પર વળગાડવાની રીત (પોઝીશન)

તમે મહિલાઓ સાથે ચર્ચા કરીને જાણવાનો પ્રયત્ન કરો કે તેણે પોતાના બાળકને કઈ રીતે દૂધ પીવડાવ્યું હતું.

એક માતાને સ્તનપાન કરાવવાનું કૌશલ્ય શીખવવું જોઈએ, જેના લીધે તેને પોતાના બાળકને પ્રભાવશાળી રીતે દૂધ પીવડાવવામાં મદદ મળે. સારા સ્તનપાન કૌશલ્યમાં પોતાના બાળકની સ્તનથી વળગાડવાની સાચી રીત અને દૂધ ચૂસવા માટે બાળકને સ્તન પર વ્યવસ્થિત લગાડવાનો સમાવેશ થાય છે.

સ્થિતિ : (પોઝીશન) :

માતા પોતાના બાળકને ખૂબ જ આરામથી કોઈ પણ સ્થિતિમાં સ્તનપાન કરાવી શકે છે. જો માતા ઈચ્છે તો સુતા-સૂતા, બેસીને અથવા ઊભા રહીને પણ બાળકને દૂધ પીવડાવી શકે છે. જો બાળક સાચી રીતે સ્તનને ચૂસતું હોય તો એ પૂરી રીતે માતાનું દૂધ મેળવી શકે છે. માતાની ભાવનાઓ, વિચાર તથા મનોવૃત્તિ સ્તનપાનને પ્રોત્સાહન આપવામાં મદદરૂપ થાય છે. માતાનો પ્રેમ, આરામ સ્તનપાનમાં

વધારો કરે છે.

શરૂ શરૂમાં નવજાત બાળક અને માતાને મદદ કરવી પડે છે, જેથી બાળક સરખી રીતે સ્તનપાન કરી શકે. આમા માતા અને માતાની સાર-સંભાળ રાખવા વાળા બીજા અન્ય વ્યક્તિઓનો સહયોગ અને સાચી માહિતી ખૂબ જ મહત્ત્વની છે. કેટલીક માતાઓને લાંબા સમય સુધી મદદની જરૂર પડે છે.

ચિત્ર ૭/૧ : (અ,બ) સાચી રીત (પોઝીશન) તથા (સ) ખોટી રીત

સાચી રીત :

આ મુખ્ય મુદ્દાઓને સ્પષ્ટ કરો -

- બાળકનું મ્હોં માતાની સામે હોવું જોઈએ અને તેના કાન, ખભો અને પીઠ એક સીધી લાઈનમાં હોવા જોઈએ.
- બાળકનો ચહેરો એકદમ સ્તનની સામે હોવો જોઈએ અને તેનું નાક નિપ્પલની સામે હોવું જોઈએ.
- માતાએ પોતાના બાળકને શરીરથી અડાડીને પકડ્યુ હોય.
- એક નવજાત બાળકને, માતા દ્વારા ફક્ત માથા અને ખભાથી નહિ પણ નીચેથી (પીઠથી) ટેકો આપવો જોઈએ.
- બાળકને દૂધ પીવડાવતા સમયે તેના માથા પર દબાણ ન આપવું.
- બાળકને દૂધ પીવડાવતી વખતે માતાએ તેની સામે પ્રેમથી જોવું જોઈએ.

માતાને જણાવો કે બાળકને મોઢામાં સ્તન આપતી વખતે સ્તનને ટેકો આપે

- પોતાના સ્તનની નીચે છાતીના આધારે હથેળી રાખીને આંગળીઓથી આધાર આપે. તેની પેહલી (ટચલી) આંગળી સ્તનને ટેકો આપે.
- તેનો અંગૂઠો સ્તન પરના કાળા ભાગથી (અરોલા) દૂર રહે, જેનીથી બાળક સ્તનની સાથે સહેલાઈથી વળગી શકે.

માતાને જણાવો કે બાળકને સ્તનથી વળગાડવા માટે કેવી રીતે પાસે લાવવાનું છે

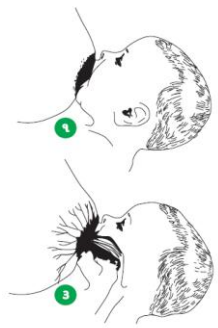
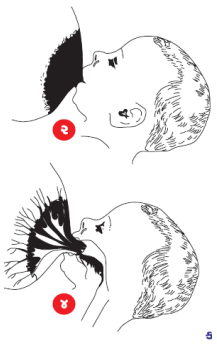
- બાળકના હોઠોને પોતાના નિપ્પલ (ડીંટડી) સાથે અડાડો.
- બાળક દ્વારા પૂરી પહોળાઈથી મ્હોં ખોલાય ત્યાં સુધી રાહ જોવો.
- મોઢું ખોલતાની સાથે બાળકને જલ્દીથી સ્તનની નજીક લાવો અને તેના નીચેના હોઠને નિપ્પલની નીચે દેવાની કોશિશ કરો.

સંદેશ :-તમે તમારા બાળકને કોઈ પણ સ્થિતિમાં (સૂતા - સૂતા કે બેસીને) ત્યાં સુધી કે ઊભા રહીને પણ સ્તનપાન કરાવી શકો છો. પરંતુ બન્નેની સ્થિતિ આરામદાયક હોય.

વળગાડવાની રીત

દૂધ ચુસવાની સાચી અને ખોટી રીત : (પોઝીશન)

અસરકારક ચૂસવા માટેની રીતમાં બાળક ડીંટડી ઉપરાંત તેની પાછળની કાળી ચામડી સહિત સ્તનનો આગળનો ભાગ મ્હોં મા રાખે છે. તેનું મ્હોં પુરી પહોળાઈથી ખુલેલું હોય છે. ચૂસવાની ખોટી રીતમાં બાળક માત્ર નિપ્પલ ને જ મ્હોં માં નાખે છે. તેનુ મ્હોં પૂરી રીતે પહોળું ખુલેલુ હોતું નથી, તથા તેની દાઢી અને નાક સ્તનથી દૂર હોય છે. જો બાળક સાચી રીતે સ્તન ચુસે છે તો સ્તનપાન સફળતાપૂર્વક થાય છે અને માતાને પણ કોઈ મુશ્કેલી પડતી નથી. પણ જો ખોટી રીતે સ્તનપાન કરે છે તો બાળકને પૂરતુ દૂધ નથી મળી શકતુ, તેનો વિકાસ સારી રીતે નથી થતો અને માતાને સ્તનપાન કરાવવામાં પીડા મશ્કેલી પણ અનુભવાય છે.

સ્તન ચૂસવાની સાચી રીત	સ્તન ચૂસવાની ખોટી રીત
	
- બાળકની દાઢી માતાના સ્તનને અડી રહી છે. - બાળકનું મ્હોં પુરુ ખુલ્લુ છે. - તેનો નીચેનો હોઠ બહારની તરફ વળેલો છે. - આપ જોઈ શકો છો કે બાળકના મ્હોં માં કાળો ભાગ ઉપરની તરફ વધારે છે અને નીચે ઓછો છે. જેનાથી સાબિત થાય છે કે બાળકની જીભ સ્તનની અંદર દૂધની નળીઓ સુધી પહોંચી રહી છે. જે દબાણ લાવીને દૂધ ને બહાર લાવે છે.	- બાળકની દાઢી માતાના સ્તનને અડતી નથી. - બાળકનું મ્હોં પુરુ ખુલ્લુ નથી. - તેનો નીચેનો હોઠ અંદરની તરફ વળેલો છે. - આપ જોઈ શકો છો કે બાળકના મ્હોં માં કાળો ભાગ ઉપરની અને નીચે ની તરફ મોટી માત્રામાં દેખાયછે. જેનાથી સાબિત થાય છે કે બાળક દૂધની નળીઓ સુધી પહોંચી નથી શક્યુ, અને માત્ર નિપ્પલ જ ચૂસી રહ્યુ છે.

બાળકને ખોટી રીતે વળગાડવાના સામાન્ય કારણ છે -

- બોટલ (શીશી) થી દૂધ પીવડાવવું.
- અનુભવનો અભાવ.
- કૌશલ્યપૂર્ણ સહકારનો અભાવ.

ખોટી રીતે વળગાડવાથી નીચે મુજબ નુકશાન થાય છે -

- માતાના નિપ્પલમાં દુખાવો, સોજો તથા ડીંટડીમાં ચીરા પડી શકે છે.
- દૂધ બરાબર ન નીકળવાથી સ્તન ભારે અથવા તો સ્તનમાં ભરાવો કે સોજો પણ આવી શકે છે.
- બાળકને પૂરતા પ્રમાણમાં દૂધ ન મળવાથી તેનું પેટ ભરાતું નથી, જેથી તે ચિડચિડિયું બની સ્તન ચૂસવાની ના પાડવાનું કારણ પણ બની શકે છે.
- બાળક પૂર્ણ રીતે સ્તનપાન કરવામાં સફળ નથી રહેતુ તેના કારણે સ્તનમાં દૂધ પણ ઓછુ બને છે.

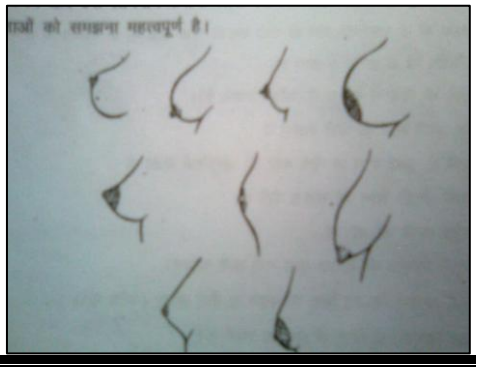
એક માતાને પોતાના બાળકને વળગાડવામાં કેવી રીતે મદદ કરાય ?

- માતાનું અભિવાદન કરો અને પૂછો કે સ્તનપાન કેવું ચાલે છે.
- એ નક્કી હશે કે તે આરામદાયક અને સરળ સ્થિતિમાં હોય.
- આપ પોતે પણ સુવિધાયુક્ત અને આરામદાયક સ્થિતિમાં બેસો.
- સ્તનપાનનું મૂલ્યાકન અને નિરીક્ષણ કરો.
- માતાથી એ વાતચીત કરો જે સ્તનપાનનાં મુલ્યાકનમાં મદદરૂપ થઈ શકતી હોય અને તેને કહો કે, શુ તે આવુ કરવા / દેખાડવા ઈચ્છશે.
- તેને સમજાવો કે તે પોતાના બાળકને કેવી રીતે પકડે, અને જો જરૂર લાગે તો તમે તેને કરીને બતાવો :-
  ચાર મુખ્ય બિંદુઓ આ છે :-
  - બાળકનું મ્હોં અને શરીર સીધું હોય
  - તેનો ચહેરો માતાના સ્તનની તરફ હોય તથા તેનું નાક બરાબર માતાના નિપ્પલ સામે હોય.
  - બાળકનું શરીર માતાના શરીરની પાસે હોય.
  - તેની પીઠને નીચેથી ટેકો આપો (જો નવજાત હોય).
- તેને કહો કે તે પોતાના સ્તનને કેવી રીતે ટેકો આપશે :-
  - તેની છાતીની સાથે સ્તનની નીચે હાથની આંગળીઓ ટેકવેલી હોય.
  - તેની પહેલી આંગળી સ્તનને સહારો આપતી હોય.
  - તેનો અંગૂઠો ઉપરની તરફ હોય.
  - તેની આંગળી નિપ્પલની ખાસ નજીક ના હોવી જોઈએ.
- તેને કહો અથવા કરીને બતાવો કે બાળકને સ્તન સાથે કેવી રીતે વળગાડે
  - પોતાના નિપ્પલને બાળકના હોઠ સાથે સ્પર્શ કરાવો.
  - જ્યાં સુધી બાળક પોતાનું મ્હોં પૂરી રીતે ના ખોલે ત્યાં સુધી રાહ જોવો.
  - હવે બાળકને જલ્દીથી સ્તનની તરફ લાવે અને અ ધ્યાન રાખે કે તેનો નીચેનો હોઠ ડિટડીની નીચે હોય.
- એ ધ્યાન રાખો કે તેની પ્રતિક્રિયા શું છે અને તેને પૂછો કે બાળકના ચૂસવાથી તે કેવું મહેસૂસ કરે છે
- સારી રીતે વળગાડવાના સંકેત જોવો
- જો બરાબર ના વળગાડેલું હોય તો ફરીથી પ્રયત્ન કરીને જોવો

૮ સ્તનની અવસ્થાઓ (સ્તનની સ્થિતિઓ)

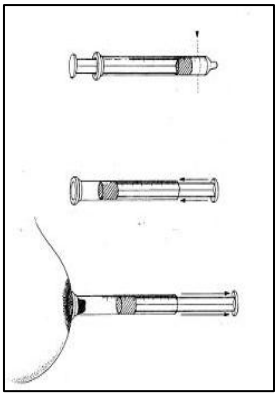
સ્તનની એવી અનેક સામાન્ય સ્થિતિઓ હોય છે કે જેનાથી ક્યારેક સ્તનપાન કરાવવામાં મુશ્કેલીઓ પડે છે.

૧. લાંબા અથવા મોટા નિપ્પલ -ડિંટડી અથવા ભરેલા સ્તન
૨. ચપટા અથવા અંદર દબાયેલા ડિંટડી
૩. અતિ ભરાવદાર સ્તન
૪. બંધ દૂધ નળિઓ અને સ્તનમાં સોજો
૫. દુઃખતા ડિંટડી અને ડિંટડીમાં ચીરા



માતાની મદદ કરવા અને તેને સ્તનપાન કરાવવાનું ચાલુ રાખવામાં સહાયતા કરવા આ બન્ને સ્થિતિ માટે સ્તનની અવસ્થાઓને સમજવી ખૂબ જ મહત્ત્વની છે.

સ્તનની બનાવટ અથવા આકાર, દૂધ બનાવવામાં કોઈ અવરોધ ઊભું કરતું નથી



૧. ડિંટડીની બનાવટ અને આકાર સાથે જોડાયેલી સમસ્યાઓ

માતાઓના સ્તનોની બનાવટ અને આકાર અલગ - અલગ હોય છે, માતાઓને એ વિશ્વાસ અપાવવો જરૂરી છે કે તેમના સ્તનનો આકાર ગમે તેવો હોય, તો પણ એ પૂરતુ દૂધ ઉત્પન્ન કરી શકે છે.

ચપટા અથવા દબાયેલા ડિંટડીઃ-

દબાયેલા ઘ્વાળી માતાઓ પોતાના બાળકને સ્તનપાન કરાવી શકે છે, કારણ કે બાળક દૂધ સ્તનમાંથી પીવે છે ના કે ડિંટડીથી બાળકને બરાબર રીતે સ્તનપાન કરાવવા માટે આવી માતાઓને ખૂબ જ સહાયતાની જરૂર પડે છે.

લાંબા ડિંટડીઃ-

આવી માતાઓને પોતાના બાળકને બરાબર રીતે સ્તનથી લગાડવામાં સહાયતા કરો, જેનાથી સ્તન બાળકના મ્હોં માં જાય.

સ્તનમાં વજન મહેસૂસ કરવું :-

આનું કારણ એ છે કે સ્તનમાં દૂધ ભરાઈ રહે છે, જેને પૂરી રીતે બહાર કાઢવામાં આવતુ નથી. સ્તનમાંથી દૂધ ટપકવાનું શરૂ રહે છે. માતાને સલાહ આપો કે બાળકને વારંવાર સાચી રીતે સ્તનપાન કરાવે.

અતિભરાવ વાળા સ્તન :- સ્તન ભરેલા રહે છે પરંતુ દૂધ નથી નીકળતું.

સ્તનની ચામડી ચમકદાર અને લાલ દેખાય છે. તેનામાં દુઃખાવો થાય છે. ક્યારેક ક્યારેક મહિલાઓને તાવ પણ આવી જાય છે.

આવું ત્યારે થાય છે :-

- જ્યારે બાળક વારે વારે સ્તનપાન નથી કરતું.
- જ્યારે ખૂબ સમય પછી સ્તનપાન કરાવવામાં આવે છે.
- જ્યારે સ્તનપાન શરૂ કરાવવામાં મોડું થાય છે.

આ પરિસ્થિતિનો સામનો કરવા માટે આ ઉપાય આપો :-

- બાળકના જન્મના એક કલાકની અંદરજ સ્તનપાનની શરૂઆત કરી દે.
- બાળકને સાચી સ્થિતિમાં વારંવાર સ્તનપાન કરાવવું જોઈએ.
- જો બાળક દૂધ ચૂસી ન શકતું હોય તો તેને દૂધ હાથ વડે કાઢીને પીવડાવો.

અતિ ભરાવદાર સ્તનોવાળી માતાઓને સહાયત કરતા માટે આ ઉપાય બતાવો :-

- ગરમ પાણીમાં પલાળેલા રૂમાલથી સ્તનોની સફાઈ કરે અથવા ગરમ પાણીથી સ્નાન કરે. સ્તનની હળવા-હળવા હાથ વડે માલિશ કરે અને ડિંટડીને ઉત્તેજીત કરે.
- સ્તનપાન કરાવ્યા પછી અથવા સ્તનમાંથી દૂધ કાઢ્યા પછી સ્તનને ઠંડો શેક આપે.
- દુઃખાવાની દવા લે.

જો આ સ્થિતિમાં કોઈ સુધારો ના થાય તો તેને આરોગ્ય કેન્દ્ર માટે રીફર કરો.

બંધ દૂધની નળી :- સ્તનમાં દુઃખતી ગાંઠ.

તેના આ કારણ હોઈ શકે છે :-

- સ્તનપાન ઓછું કરાવવું અથવા બરાબર અંતરે ના કરાવવું.
- રાત્રે સ્તનપાન ન કરાવવું.
- ફિટ કપડા પહેરવા
- ડિટડીમાં ચીરા પડવા
- સ્તનનો આકાર મોટો હોવો.

બંધ દૂધ નળીવાળી માતાઓને આ ઉપાય બતાશો :-

- સ્તનપાન કરાવવાની સ્થિતિ (પોઝીશન) બરાબર રાખે.
- થોડા - થોડા સમય બાદ સ્તનપાન કરાવે.
- સ્તનપાન કરાવતી વખતે ગાંઠ ધીરે-ધીરે નિપ્પલની તરફ માલીશ કરે.
- ઢીલા કપડા પહેરો.

સ્તનમાં સોજો

આ દૂધ નળીઓ બંધ થઈ જવાના કારણે અથવા સ્તનમાં અતિ ભરાવો થઈ જવા પછી સોજાનો કારણે થાય છે. માતાને તાવ આવી જાય છે, અને સ્તન લાલ, ગરમ, સોજી ગયેલા હોય છે અને તેમાં દુ : ખવો થાય છે.

આનાથી પીડાતી માતાઓને આ ઉપાય આપો :-

- પ્રભાવિત સ્તનમાંથી હાથથી દૂધ દબાવીને કાઢે.
- પ્રભાવિત સ્તનમાંથી બાળકને સાચી સ્થિતિમાં વારંવાર સ્તનપાન કરાવો અને અપ્રભાવિત સ્તનથી પણ સ્તનપાન કરાવો.
- દુઃખાવાની દવા લે.

અગર જો માતાની હાલત એક-બે દિવસમાં ન સુધરે તો તેને નજીકના પ્રાથમિક આરોગ્ય કેન્દ્રમાં મોકલો.

ડિંટડીમાં ચીરા અને દુઃખવા નિપ્પલ :-

જ્યારે બાળક ખોટી સ્થિતિમાં સ્તનપાન કરતા ડિંટડીને વારંવાર અંદર - બાર ખેચે છે, તો તેનાથી ડિંટડીની ચામડીને નુકશાન પહોંચે છે. જેનાથી ડિંટડીમાં ચીરા પડી જાય છે, અને તે દુઃખવા લાગે છે. સ્તનોને વારે વારે સાબુથી ધોવાને કારણે પણ ડિંટડી દુઃખવા લાગે છે. આવી માતાઓમાં વિશ્વાસ જગાડો અને સ્તનપાન કરાવવાની સલાહ આપો. સ્તનપાનની સાચી સ્થિતિ બતાવવામાં તેની મદદ કરો.

ડિંટડીમાં ચીરા અને દુખાવા વાળી માતાઓને આ ઉપાય આપો :-

- સ્તનપાનની સ્થિતિ બરાબર કરે.
- પ્રભાવિત અંગમાં થોડા સમય માટે હવા અને તડકો લાગવા દો.
- ઢીલા કપડાં પહેરે.
- દવાવાળાં ક્રિમ કે લોશન ના લગાડે
- સ્તનપાન કરાવ્યા પછી દરેક વખતે ડિંટડી તથા એરોલા પર છેલ્લુ દૂધ લગાડે.

અંદરની તરફ દબાયેલા ડિંટડી :- આવી ડિંટડી અરોલા/કાળા ભાગની અંદર હોય છે, જો તમે એને બહારની તરફ ખેંચવાનો પ્રયત્ન કરો તો એ સ્તનની અંદર ચાલ્યુ જાય છે. આ એક મુશ્કેલની સ્થિતિ છે.

અંદર દબાયેલ ડિંટડીવાળી માતાઓમાં આત્મશ્વિાસ જગાડો અને આ ઉપાય આપો :-

- બાળકને સ્તન અડવા દો અને ચામડીથી ચામડીનો સંપર્ક બનાવો.
- બાળકને સ્તનથી વળગાડવામાં માતાની મદદ કરો.
- ડિંટડીને અલગ કરવામાં માતાની મદદ કરો.
- સિરિંજ પમ્પનો ઉપયોગ કરો.
- સ્તનનું દૂધ હાથથી કાઢો અને બાળકને કપથી પીવડાવો.

સિરિંજ પમ્પનો ઉપયોગ કેવી રીતે કરાય, માતાની સામે તેને દેખાડો :-

- માતાને સિરિંજ દેખાડો અને તેને બતાવો કે તમે સિરિંજ ના આગળના ભાગને કેવી રીતે કાપ્યું છે.
- પ્લંજરને (સિરિંજ ખેચવાના ભાગને) આગળના કાપેલા ભાગમા લગાવો, એટલેકે સામાન્ય સ્થિતિ થી ઉન્ધુ.
- એક મોડલ સ્તનનો ઉપયોગ કરો તથા સિરિંજ ના છેડાને ડિંટડી ઉપર રાખો. સિરિંજ ખેચવાના ભાગને ખેચો જેથી નિપ્પલ બહારની તરફ ખેચાય.
- સિરિંજ ખેચવાના ભાગને ધિરે ધિરે ખેચવો જેથી દબાળ ધીરે થી વધે.
- દિવસમાં ઘણી વખત ૩૦ સેકન્ડથી લઈને ૧ મિનિટ સુધી આ પ્રક્રિયા કરો.
- જો માતને દુઃખાવો થતો હોય તો ચુષણ ને ઓછું કરવાવાળી પ્લંજરને પાછી ખેંચી લો. (આનાથી ડિંટડી અને અરોલાની ચામડી ખરાબ થતી નથી).
- જ્યારે માતા પોતાના સ્તનથી સિરિંજ દૂર કરવા માંગે તો ચુષણ ને ઓછુ કરવા માટે સિરિંજને પાછી ખેચી લો.
- જ્યારે ડિંટડી બહાર નિકળી જાય, તો બાળકને સ્તનપાન કરાવવાનું શરૂ કરી દો.

પહેલું પગલું:- અહિં બ્લેડથી કાપી લો.

બિજુ પગલું : પ્લંજરને તેના (સિરિંજ ખેચવાના ભાગને) મૂળ સ્થાનેથી કાઢી કાપેલા છેડા / ભાગની તરફથી પ્લંજરને અંદર નાખો.

ત્રિજું પગલું : માતા ધીમેથી પ્લંજરને ખેચી લે છે.

૯ બાળકનું સ્તનપાન કરવાથી ઈન્કાર કરવું અને રડવું

કેટલીક વાર માતાઓ એ ફરિયાદ કરતી હોય છે કે બાળક રડે છે. અને સ્તનપાન નથી કરતું, અથવા તો સ્તનપાન માટે અનિચ્છા દર્શાવે છે. આનાથી માતાને ખૂબ દુઃખ અને ચિંતા પણ થાય છે અને તે ઉદાસ અને નિરાશા અનુભવે છે.

બાળકના રડવાના કારણ	
- અસહજતા	- ગંદકી , ગરમી, ઠંડી
- થાક	- ઘણાં માણસોની અવર - જવર
- બીમારી અથવા દુખાવો	- કાનનો દુઃખાવો અથવા સેપ્ટી સીમિયા
- ભૂખ્યું રહેવું	- પુરતુ દૂધ ન મળવું, વધારે દૂધ આવવું
- માતાનું ભોજન	- કોઈપણ ભોજન, કેટલીક વાર ગાયનું દૂધ
- માતા દ્વારા લેવામાં આવતા કેફી દ્રવ્યો	- કેફી દ્રવ્ય, સિગરેટ, અન્ય દવાઓ
- માતાનું દૂધ વધારે પ્રમાણમા આવવું	
- માથાનો દુઃખાવો	
- બહુ અપેક્ષાવાળું બાળક, અવાજ, ભીડ ભર્યુ વાતાવરણ	

સ્તનપાન ન કરવાના આ કારણ હોઈ શકે છે :

- બાળક બિમાર છે અને બેચેન છે (દુઃખાવો, તાવ, મ્હોં માં ચાંદા પડવા, ઊલ્ટી, ઝાડા, શરદી વગેરેને કારણે)
- સ્તનપાન કરાવવાની ખોટી રીત

- ફેરફાર, જેનાથી બાળક હેરાન થઈ જાય છે. (શરીરની ગંધમાં ફેરફાર, જગ્યામાં ફેરફાર, નવી સાર - સંભાળ રાખવાવાળી વ્યક્તિ થી અલગ થવું)
- વધારે પડતું દૂધ આવવું
- ધ્યાન ખેચાવું (૩ માહિનાથી ઉપરના બાળકોનું આસાનીથી ધ્યાન ખેંચાઈ જાય છે.)
- ઘોંઘાટ ભીડ ભર્યું વાતાવરણ

બાળકોનું વધારે રડવાનું કારણ નીચે પ્રમાણે હોઈ શકે છે :

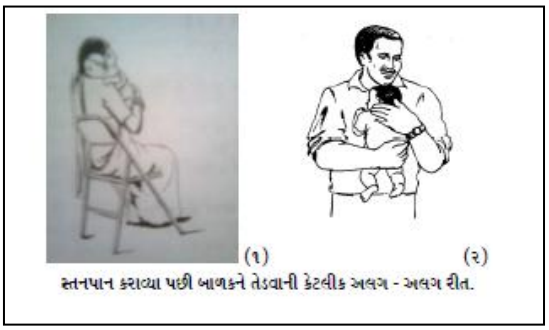
- સ્તનપાન કરવાથી ઈન્કાર
- ભૂખ (પૂરતું દૂધ ન મળે, વિકાસ)
- બાળકોની વધારે અપેક્ષા, કેટલાક બાળકો બીજા બાળકો કરતાં વધારે રડે છે તેમને તેડીને વધારે વાર સુધી ફેરવવા પડે છે.

સ્તનપાનની ના પાડતા અને રડતા બાળકોની માતાને સહાય કરવા માટે આ ઉપાય આપો :-

- જો બાળક બીમાર હોય તો તેને નજીકના સ્વાસ્થ કેન્દ્ર પર લઈ જાવ.
- જો બાળક પોતાની જાતે દૂધ ના ચૂસી શકતું હોય, તો તેને સ્તનમાં થી કાઢેલું દૂધ કપથી પીવડાવો.
- બાળકને તેડતી વખતે તેના દુઃખતા અંગ / ભાગને ના દબાવો.
- જો નાક બંધ થઈ ગયું હોય, તો મીઠાવાળા પાણીમાં રૂ પલાળી તેના વડે નાક સાફ કરો.
- એક વારમાં બાળકને સ્તનપાન કરાવતી વખતે ફક્ત એક જ સ્તનથી દૂધ પીવા દો. બીજી વાર બીજા સ્તનથી દૂધ પીવડાવો.

વ્યાવહારિક મદદ કરો :-

માતાને અને તેના પરિવારના અન્ય સભ્યોને એ કહો કે રડતા બાળકને ચૂપ કરાવવાની સૌથી સારી રીત એ છે કે તેને પોતાની છાતી સાથે લગાવો. તેના પેટને હળવેથી પંપાળો. (ચિત્ર ૧, ૨ તથા ૩) માતાને દેખાડો કે બાળકને કેવી રીતે ચૂપ કરાવી શકાય છે. તેને ખોળામાં બેસાડો અથવા ખભા સાથે લાગવો (ચિત્ર ૪)



(૧) (૨)

સ્તનપાન કરાવ્યા પછી બાળકને તેડવાની કેટલીક અલગ - અલગ રીત.

(૩) (૪)

સ્તનપાન કરાવ્યા પછી બાળકને તેડવાની કેટલીક અલગ - અલગ રીત.

૧૦ હાથ વડે માતાનું દૂધ કાઢવું

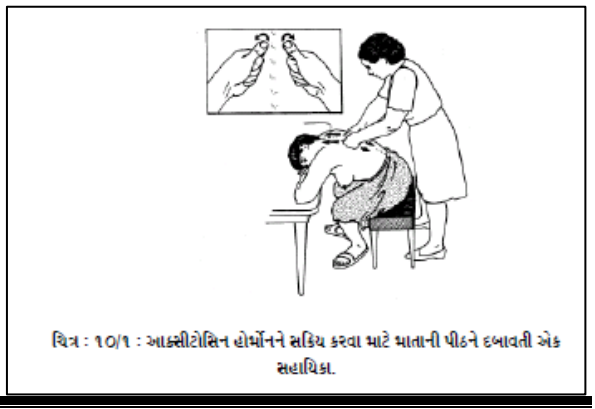
કેટલીક પરિસ્થિતિઓ માં જ્યારે બાળક બિમાર હોવાને કારણે બરાબર દૂધ ચૂસી નથી શકતું, ઓછા વજન વાળું બાળક, સ્તનની સ્થિતી અને માતા કામ કરતી હોય ત્યારે માતાએ પોતાના સ્તનમાંથી દૂધ કાઢતા રહેવાની જરૂરત રહે છે. કાર્યકર્તાઓ આ પરિસ્થિતિને ઓળખવામાં અને દૂધ કાઢવાની સાચી રીત બતાવવામાં માતાની મદદ કરી શકે છે.

જે પરિસ્થિતિમાં સ્તનમાંથી દૂધ નિકાળવાની જરૂર પડે છે તે નીચે મુજબ છે :

- સ્તન મા દૂધ ભરાવવાથી રાહત મેળવવા માટે.
- બિમાર બાળક માટે જે બરાબર રીતે સ્તનપાન નથી કરી શકતું.
- નવજાત બાળક, જે ઓછા વજનવાળું અથવા નબળું છે,. તેને કપથી દૂધ આપવા માટે કારણ કે તે સ્તનપાન કરવા અસમર્થ છે.
- માતા અથવા બાળક બિમાર હોય જેથી માતા બાળકને સ્તનપાન નથી કરાવી શકતી.
- સ્તનની સમસ્યાને કારણે જ્યારે માતા સ્તનપાન ન કરાવી શકતી હોય.
- બાળકને ઘરમાં છોડીને બહાર કામ કરવા જતી માતાઓ માટે.

પોતાના હાથથી દૂધ કાઢવું :- આ દૂધ કાઢવાની સૌથી સરળ અને સુરક્ષિત રીત છે.

૧. માતામાં વિશ્વાસ ઉત્પન્ન કરો :



ચિત્ર : ૧૦/૧ : ઓક્સીટોસિન હોર્મોનને સક્રિય કરવા માટે માતાની પીઠને દબાવતી એક સહાયિકા.

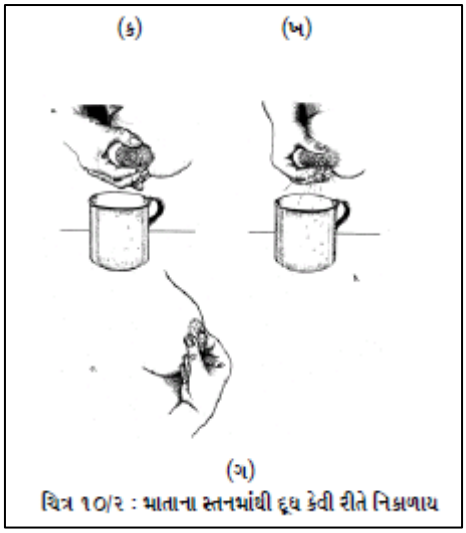
- જો શક્ય હોય તો બાળકને માતાના ખોળામાં લો.
- દુઃખાવો અને ચિંતાના કારણોને ઓછા કરવાનો પ્રયત્ન કરો.
- પોતાના બાળકની વિશે પ્રેમથી વિચારવામાં તેની મદદ કરો.

૨. વાસણને તૈયાર કરવું :

- દૂધ કાઢવા માટે ખુલ્લાં મોઢાવાળો કપ, ગ્લાસ, વાટકો / ચમચી લો.
- કપને સાબુ અને પાણીથી સારી રીતે ધોઈ લો.
- વ્વાટકી અને ચમચીને ગરમ પાણીથી ધોઈ લો.

૩. માતાને દૂધ કાઢવા માટે માનસિક રીતે તૈયાર કરો :

- શાંતિથી એકલતામાં પોતાની સહાયક મહિલા સાથે બેસો.
- આરામ આપતું ગરમ પીણું લો. ફક્ત કોફી ના લો.
- નવશેકા પાણીથી સ્તનોને ધોઈ લો.
- સારી રીતે હાથ સાફ કરો.
- સ્તનની હળવા હાથે માલિશ કરો.
- આક્સિટોસીન હોર્મોન ને સક્રિય કરવા માટે નિપ્પલને ધીમે-ધીમે દબાવો અથવા પંપાળો.
- પોતાની સહાયિકાને પીઠ દબાવવા કહો. (ચિત્ર ૧૦/૧ (અ,બ))



ચિત્ર ૧૦/૨ : માતાના સ્તનમાંથી દૂધ કેવી રીતે નિકળાય

૪. હાથ વડે દૂધ કાઢવુ :

- આરામદાયક સ્થિતિમાં બેસો અથવા ઊભા રહો અને વાસણ / કપને સ્તનની પાસે લઈ જાય.
- હાથનો અંગૂઠો નિપ્પલ અને એરોલા (કાળા ભાગ) ની ઉપર અને પહેલી આંગળી નિપ્પલની નીચે રાખો. બાકી આંગળીઓ થી સ્તનોને પકડીને દબાવો. (ચિત્ર ૧૦/૨ (ક))
- અંગૂઠા અને પહેલી આંગળીથી હલ્કા હાથે સ્તનને છાતી તરફ દબાવો. બહુ અંદર સુધી ના દબાવો એનાથી દૂધની નળી બંધ થઈ શકે છે. (ચિત્ર ૧૦/૨ (ખ))
- દબાવો અને ઢીલું કરો. ફરીથી દબાવો અને ઢીલું કરો.
- આવું વારંવાર કરો. થોડી વારમાં દૂધ ટપકવાનું શરૂ થઈ જશે. (ચિત્ર ૧૦/૨ (ગ))
- સ્તનને ચારે બાજુથી દબાવો. જેથી બધી બાજુથી દૂધ બહાર આવે.
- એક સ્તનથી ૩-૫ મિનિટ, પછી બીજા સ્તનથી ૩-૫ મિનિટ સુધી દૂધ કાઢો. તેના પછી બન્ને સાઈડ ફરીથી આવું કરો.
- કાર્યકર્તા એ માતાને સમજાવે કે સ્તનમાંથી દૂધ કાઢવા માટે આમ તો ૨૦ થી ૩૦ મિનિટ લાગે છે ત્યારે પૂરી માત્રામાં દૂધ નીકળે છે.
- હાથ વડે કાઢેલું દૂધ એક સાફ વાસણમાં ૮ કલાક સુધી તથા ફ્રિજમા ૨૪ કલાક સુધી રાખી શકાય છે.
  - ❋ ડિંટડીને ન દબાવો.
  - ❋ સ્પીડથી દૂધ ન કાઢો.
  - ❋ અંગુઠો અને આંગળી ચામડી પર ના ઘસો

૧૧ પૂરતું દૂધ ન આવતું હોવાનો અનુભવ

"મારા સ્તનોમાં પૂરતું દૂધ નથી" આ દરેક ઘર માં દરેક માતાની ફરીયાદ હોય છે. બાળકને ઉપરી ખોરાક શરૂ કરવા માટે માતાઓ દ્વારા આપવામાં આવતું આ સામાન્ય વાત છે. તમારે આ ખોટી માન્યતાને દૂર કરવાની છે.

એવી માતાઓની મદદ કેવી રીતે કરાય જેનું બાળક પુરતું દૂધ નથી મેળવી શકતું	
સફળ સ્તનપાન માટે જરૂરી છે:	પુરતું દૂધ ન હોવાના સામાન્ય કારણો:
- પ્રેરણા અને વિશ્વાસ	- પ્રેરણ અને વિશ્વાસની કમી
- જન્મના અડધા / ૧ કલાકની અંદર સ્તનપાન શરૂ કરાવુ.	- જન્મ પછી મોડેથી સ્તનપાન શરૂ કરવું.
- બાળક ધવડાવવાની સાચી રીત (પોઝીશન)	- બાળક ધવડાવવાની ખોટી રીત (પોઝીશન)
- બાળક માંગે ત્યારે આહારપૂર્તિ	- ચોક્કસ સમય પર આહારપૂર્તિ
- રાત્રે સ્તનપાન	- રાત્રે સ્તનપાન ન કરાવવું, સ્તનપાન લાંબા અંતરે થી કરાવવુ
- માતા અને બાળકને એક સાથે રાખવા.	- માતા અને બાળકને અલગ-અલગ રાખવા.
- બાળકને ૬ મહિના સુધી ફક્ત સ્તનપાન	- ઉપરી આહાર જલ્દી શરૂ કરી દેવો.
- બાળકને રબરની નિપ્પલ અથવા ચૂસણી ન આપવી.	- બોટલથી દૂધ પીવડાવવું તથા ચૂસણી આપવી

જ્યારે માતાને તેના પરિવાર તરફથી સહયોગ અને મદદ નથી મળતી તો તેનો આત્માવિશ્વાસ તૂટી જાય છે, તે ચિંતીત થઈ જાય છે, જેમ કે લીંગ ભેદભાવના કારણે અને આ કારણ થી દૂધ આવવાનું ઓછું થઈ જાય છે. જો કોઈ કારણસર બાળક પૂરતું સ્તનપાન નથી કરી શકતું, ત્યારે પણ દૂધની બનાવટ ઘટી જાય છે.

એક યોગ્ય કાર્યકર્તાને રીતે તમારે આ સમસ્યા માટે વધારે ધ્યાન આપવું પડશે :

જ્યારે માતા એવું વિચારે છે કે તેના સ્તનેમાં વધારે દૂધ નથી, ત્યારે પણ બાળકને તેની જરૂરિયાત મુજબનુ દૂધ મળી રહ્યુ હોય છે.

આ સમસ્યાના સમાધાન માટે તમારે વ્યાવહારિક દ્રષ્ટિકોણ આપનાવો પડશે :-

- નિર્ણય કરો કે શું બાળકને પૂરતું દૂધ મળી રહ્યું છે.
- વિચારો કે બાળકને પૂરતું દૂધ કેમ નથી મળતું.
- માતા અને બાળકની મદદ કરો.

યાદ રાખો :-જો બાળક સાચી રીતે સ્તનપાન કરતુ હોય, તો માતા જોડિયા બાળકો માટે પણ પૂરતું દૂધ ઉત્પન્ન કરી શકે છે

(ક) નિર્ણય કરો કે શું બાળકને પૂરતું દૂધ નથી મળતું :

વિશ્વાસપત્ર લક્ષણ :	
- ઓછુ વજન વધવું	- ૧ મહિનામાં ૫૦૦ ગ્રામ કરતા ઓછું - બે અઠવાડિયા પછી પણ જન્મના વજન કરતાં ઓછું વજન
- થોડો થોડો કરીને ઘાટો પેશાબ કરવો	- ૧ દિવસમાં ૬ વારથી ઓછો વાસ આવે તેવો અને પીળા કલરનો પેશાબ કરવો

અવિશ્વાસપાત્ર લક્ષણ :

- સ્તનપાન પછી બાળક સંતુષ્ટ નથી
- બાળક રોજ રડે છે
- બહુ જલ્દી જલ્દી સ્તનપાન
- એક સમયે બહુ લાબાં સમય સુધી સ્તનપાન લેવું
- બાળકનું સ્તનપાન કરવાની ના પાડવી
- હાથથી દૂધ કાઢવા છતા દૂધ ન આવવું
- ગર્ભાવસ્થા દરમિયાન સ્તનોનો આકાર મોટો ન થવો
- પ્રસૂતિ પછી દૂધ ન આવવું

(ખ) મૂલ્યાકન કરો કે બાળકને પૂરતું દૂધ કેમ નથી મળતું :

તમે સ્તનપાનનું મૂલ્યાકન કરો અને તપાસ કરો કે પૂરતું દૂધ ન આવવાનું સામાન્ય કારણ શું છે. (બોક્સ જુઓ)

ઘણી માતાઓનું એવું માનવું હોય છે કે નીચેના કારણોથી તેને પૂરતી માત્રામાં દૂધ નથી બનતું , પરંતુ હકિકતમાં તેનો માતાના દૂધ પર કોઈ પ્રભાવ નથી પડતો :-

- માતાની ઉમર
- યૌન ક્રિયા અથવા સંભોગ
- માસિક ફરીથી શરૂ થઈ જવું
- સગા-સંબંધીઓ અને પડોશીઓનો અસ્વીકાર
- નોકરી પર જવું (જો બાળક રોજ સ્તનપાન શરૂ રાખે છે)
- બાળકની ઉમર
- ઓપરેશનથી બાળક જન્મવું
- જાજા બાળકો
- મામૂલી , સામાન્ય ખોરાક

(ગ) માતા અને બાળકની મદદ કરો :

- માતાની સલાહ માનતા અને તેના સારા કાર્યોના વખાણ કરતા તેનામાં વિશ્વાસ ઉત્પન્ન કરો
- સારી સ્થિતિમાં સ્તનપાન કરાવવામાં તેની મદદ કરો
- આ ઉપાય આપો : જો બાળક પુરતી માત્રામાં દૂધ નથી પી રહ્યું તો
  - વધારે વખત સ્તનાપાન કરાવો , રાત્રીના સમયે લાંબા સમય સુધી
  - બોટલ અને ચૂસણીઓનો ઉપયોગ બંધ કરો
  - અન્ય ખોરાક આપવાનું બંધ કરો
- બાળકને પૂરતુ દૂધ મળી રહ્યું છે કે નહિ તે જાણવા માટે, થોડા - થોડા દિવસો પછી તેનું વજન કરાવો અને એ વાત નોટિસ કરો કે તે દિવસમાં કેટલી વાર પેશાબ કરે છે.

યાદ રાખો :-જો બાળકનું વજન બરાબર વધતું હોય અને તે દિવસમાં લગભગ છ વાર પેશાબ કરતું હોય અને તેને ફક્ત સ્તનપાન જ કરાવાતું હોય, તો નિશ્ચિત રૂપે બાળકને પુરતું દૂધ મળી રહ્યું છે

પુરતું દૂધ ન હોવાના અસામાન્ય કારણ :-

- ગર્ભનિરોધક ગોળીઓને પ્રયોગ
- પેશાબનું પ્રમાણ વધારવા માટે દવાઓનો ઉપયોગ
- ગર્ભધારણ
- માતામાં ગંભીર કપોષણ
- માતાનું નશાનું આદી હોવું અથવા ધુમ્રપાન કરવું
- બાળક બિમાર હોય
- બાળકમાં જન્મથી જ ખોડખાંપણ

ઉપરના કારણોથી ઉત્પન્ન થતી સમસ્યાઓ માનવ સર્જીત છે, કારણ કે માતાની જાણકારી ખોટી અને અધૂરી હોય છે. તથા તેને સાચા સમયે સાચી સલાહ અને વ્યાવહારિક મદદ નથી મળતી.

માતાની મદદ કરવી - અસામાન્ય કારણોથી પુરતું દૂધ ઉત્પન્ન ન કરતી માતા :-

કાર્યકર્તા કેટલીક ખાસ પરિસ્થિતિમાં માતાની મદદ કરી શકે છે. માતાને આવી મદદ ત્યારે લેવી પડે છે જ્યારે :

બાળકની હાલત - જો બાળક બીમાર હોય અથવા અસામાન્ય લાગતું હોય, તો તેને ડોક્ટરની પાસે મોકલવું જ યોગ્ય છે.

માતાની હાલત -જો માતા ગર્ભનિરોધક ગોળીઓ લેતી હોય અથવા પેશાબ વધારવા માટે ગોળી લેતી હોય, તો તેને ડોક્ટરની સલાહ મુજબ દવા બદલવા માટે કહો.

કોઈપણ બીજી અસામાન્ય હાલતમાં માતાને સ્વાસ્થ્ય કેન્દ્ર પર લઈ જવા અથવા ડોક્ટરની પાસે લઈ જવામાં તેની મદદ કરો.

જ્યાં સુધી માતામાં આત્મવિશ્વાસ ઉત્પન્ન થાય, ત્યાં સુધી દરેક અઠવાડિયે તેને મળતાં રહો. જો માતા એવું વિચારતી હોય કે તેના સ્તનોમાં પુરતું દૂધ નથી તો સમય પર યોગ્ય સલાહ આપી તથા વ્યાવહારિક મદદ કરીને તમે તે માતામાં આત્મ - વિશ્વાસ ઉત્પન્ન કરી શકો છો,.

જો માતામાં આ નકારાત્મક વિચાર ઘર કરી જાય કે તે પુરતું દૂધ ઉત્પન્ન નથી કરી શકતી, તો તેનામાં આત્મ - વિશ્વાસ ઉત્પન્ન કરવો એ જ સાચું સમાધાન છે

એવી માતાની કેવી રીતે મદદ કરી શકાય જેનું બાળક પુરતું દૂધ નથી પ્રાપ્ત કરી શકતું	
➢ કારણની તપાસ કરો :-	
- કરવામાં આવતા પ્રયત્ન - સાંભળવું અને શીખવું - આગળની વાત વિશે તપાસ કરો - સ્તનપાનનું મુલ્યાંકન કરો - બાળકની તપાસ કરવી - માતાની તપાસ કરવી - માતાના સ્તન તપાસવા	- જેને તમે જોઈ તથા અનુભવી શકો છો. - મનોવૈજ્ઞાનિક ઘટક, માતા કેવુ અનુભવ કરે છે - સ્તનપાનનું સત્ય, ગર્ભનિરોધક ગોળીઓ, પેશાબની માત્રા વધારતી ગોળીઓ - બાળકની માતાના સ્તન સાથે વળગવાની રીત - બાળકનો પ્રેમ અથવા ઈન્કઝા - બિમારી કે વિકૃતિ, વિકાસ - માતાનું પોષણ અને સ્વાસ્થ્ય - કોઈ પણ સ્તન સબંધી સમસ્યા
➢ આત્મવિશ્વાસ વધારો અને સમર્થન આપો	
બાળકને વધારેમાં વધારે સ્તનપાન અથવા માતાનું દૂધ આપવામાં માતાની મદદ કરો, અને તેનામાં એ વિશ્વાસ ઉત્પન્ન કરો કે તે પુરતું દૂધ ઉત્પન્ન કરી શકે છે.	
- સ્વીકાર કરો. - માતાના વખાણ કરો(જો ઉપયુક્ત હોય) - વ્યાવહારિક સહાયતા આપો - ઉપયોગી જાણકારી આપો - સરળ ભાષાનો ઉપયોગ કરો	- તેના સ્તનોમાં દૂધની આપૂર્તિ વિશે નો વિચાર, - તેને પોતાના બાળક તથા તેના સ્તનપાન કરાવવાના અનુભવ વિશે. - તે હજુ પણ સ્તનપાન કરાવી રહી છે - દૂધ ઉત્પન્ન કરાવા માટે તેના સ્તન બરાબર છે - બાળકનું સ્તન સાથેનું વળગાળ (એટેચમેન્ટ)વ્યવસ્થિત કરો - તેને કહો કે બાળકનું ચૂસવાની ક્રિયા કેવી રીતે દૂધ ને નિયંત્રીત કરે છે. તેને કહો કે બાળક વધારે દૂધ કેવી રીતે મળી શકે છે - બાળક જેટલું વધારે દૂધ પીશે, સ્તનોમાં અટેલું જ વધારે દૂધ પૈદા થશે. - જલ્દી - જલ્દી સ્તનપાન કરાવતા રહો. જાજી વાર સુધી કરાવો અને રાત્રે કરાવો. - દૂધની બોટલ અથવા ચૂસણીનો ઉપયોગ ન કરો, (જો જરૂરી

- ઉપાય આપો (જે ઉપયોગી હોય)	હોય તો કપ વાપરો.) - ચિંતા ઘટાડવાના વિચાર આપો અને પરિવારથી વાત કરવાનો પ્રસ્તાવ મૂકો.
➢ ઓછા સામાન્ય કારણોમાં મદદ :-	
- બાળકની સ્થિતિ - માતાની સ્થિતિ	- જો બાળક બીમાર અથવા અસામાન્ય છે, તો સારવાર કરો અથવા આઈ. એમ. એન. સી. આઈ મુજબ રેફર કરો - જો ગર્ભનિરોધક ગોળી કે પેશાબની માત્રા વધારતી ગોળી લેતી હોય, તો તેને બદલવા માં મદદ કરો - અન્ય પરિસ્થિતિઓ માટે સ્થિતિ મુજબ મદદ કરો
➢ ફોલોઅપ :-	
માતા અને બાળકને પહેલા દરરોજ અને પછી અઠવાડિયામાં એક વાર ત્યાં સુધી જોતા રહો જ્યાં સુધી કે બાળકનું વજન વધવા લાગે અને માતામાં આત્મવિશ્વાસ આવી જાય	

૧૨ જન્મથી ઓછા વજનવાળા બાળકને સ્તનપાન કરાવવું

જન્મના સમયે ઓછા વજનવાળું બાળક - એટલે ૨.૫ કિ.ગ્રા. થી ઓછા વજનવાળુ બાળક.
આ અધુરા મહિને જન્મેલું બાળક હોય છે અથવા તો જન્મના સમયે ખૂબ જ નબળુ હોય છે. આવા બાળકોને સામાન્ય બાળકો કરતા વધારે સ્તનપાનની જરૂર હોય છે. ઓછા વજનવાળા બાળકો માટે તેની માતાનું દૂધ જ સર્વોત્તમ હોય છે.
આવા કેટલાક બાળકો જાતે સ્તનપાન કરી શકે છે, કેટલાક ને સ્તનમાંથી કાઢેલુ દૂધ કપથી પીવડાવવું પડે છે, ખૂબ જ નબળુ બાળક કપથી પણ દૂધ પી નથી શકતું. તેમને વિશેષ દેખભાળની જરૂરત હોય છે.

કપથી બાળકને દૂધ કેવી રીતે પીવડાવાય :

- બાળકને ખોળામાં એકદમ સીધું અથવા થોડા સીધુ બેસાડો
- દૂધ વાળા કપને બાળકના હોઠથી લગાડો
- કપ હળવેથી બાળકના હોઠના નીચલા ભાગને અડે અને કપને બહારનો ભાગ ઉપરના હોઠને અડે
- કપને થોડો વાળો, જેનાથી દૂધ બાળકના હોઠ સુધી પહોચી જાય
- બાળક સજાગ થઈ જશે અને પોતાનું મોહું અને આંખ ખોલી દેશે
- ઓછા વજન વાળું બાળક જીભની મદદથી દૂધ મોઢામાં લેવાનું શરૂ કરશે
- પૂર્ણ સ્વસ્થ અથવા થોડુ મોટું બાળક દૂધ ઢોળતા ઢોળતા પીવે છે
- જ્યારે બાળક પૂરતા પ્રામણમાં દૂધ પી લે છે, તો એ પોતાનું મોહું બંધ કરી દે છે કે હવે બીજું નથી પીવુ

સાવધાનીઓ :- - દૂધ બાળકના મોઢામાં રેડવાનું નથી (કપને એવી રીતે પકડો કે દૂધ તેના હોઠને અડે તે જાતે દૂધ પીવે) - રડતા બાળકને દૂધ ન પીવડાવો - સૂતા બાળકને દૂધ ન પીવડાવો - પથારી પર સૂતેલા બાળકને દૂધ ન પીવડાવો	 ઓછા વજનવાળા બાળકને માતાનું દૂધ કપથી પીવડાવી રહ્યા છે.

પૂરા મહિનાનાં જોડિયાં બાળકો

મોટા ભાગની માતાઓના સ્તનમાં જોડિયાં બાળકોને દૂધ પીવાડાવવા માટે પૂરતા પ્રમાણમાં દૂધ હોય છે. માતા બન્ને બાળકોને દૂધ પીવડાવી શકે છે. આ વાતનો વિશ્વાસ આપવા માટે તેને પૂરતા પ્રોત્સહન અને સમર્થનની જરૂરત હોય છે. કેટલીક માતાઓ બંને બાળકોને એક સાથે દૂધ પીવડાવે છે, જ્યારે કેટલીક માતાઓ વારા-ફરતી દૂધ પીવડાવે છે.

જોડિયાં બાળકોની માતાની મદદ કેવી રીતે કરી શકાય :

- માતાને વિશ્વાસ બેસાડો કે તે બન્ને બાળકો માટે પૂરતું દૂધ ઉત્પન્ન કરી શકે છે.
- તેને કહો કે વધારે સ્તનપાન કરાવવાથી વધારે દૂધ બને છે, જો બે બાળકોને પીવું હોય તો બન્ને માટે સ્તનોંમા પૂરતા પ્રમાણમાં દૂધ હશે.
- તેને પ્રોત્સાહિત કરો અને કહો કે નબળા બાળકને વધારે દૂધ મળવું જોઈએ.
- બન્ને બાળકોને એકસાથે દૂધ પીવડાવી શકાય છે.

- જોડિયા બાળકોને એક સાથે દૂધ પીવડાવવાની એક રીત એ છે કે બાળકોને તેમના શરીર સહિત એવી રીતે પકડો, જે માતાના હાથ અને શરીરની સાથે બાળકોનાં પગ સામ - સામે થતા હોય(ચિત્ર જુઓ) અને તેમને કહો કે નબળા બાળકને વધારે દૂધ પ્રાપ્ત થાય.
- તેના પતિ અને પરિવારના અન્ય સભ્યો સાથે વાત કરો કે તેઓ કઈ રીતે અન્ય કામોમાં તેની મદદ કરી શકે છે, જેનાથી માતા સ્તનપાન કરાવવા માટે સમય કાઢી શકે.

સ્તનપાન માટે જોડિયાં બાળકોને પકડવાની બે રીત

૧૩ આહાર – પોષણની ઉણપને પૂર્ણ કરવા વાળા ખાદ્ય પદાર્થ

૬ મહિના પછી ફક્ત સ્તનપાન જ બાળકના પોષણની જરૂરિયાત પૂરી પાડી શકતું નથી. આ સમયે બે વર્ષ અથવા તેનાથી વધારે સમય સુધી સ્તનપાનની સાથે સાથે ઉપરી આહાર પણ દેવો ખૂબ જરૂરી બને છે. જો તેને આ ખોરાક ન મળે તો તેનો વિકાસ અને વૃધ્ધિ બરાબર નથી થતી અને તેનો વિકાસ અટકી જાય છે.

ઉપરી આહારને લગતી નીચેની બાબતો ધ્યાનમાં રાખવી જોઈએ :

- ૬ મહિનાની ઉમર પછી બધાજ બાળકોને ઉપરી આહારની જરૂરત હોય છે.
- ૬ થી ૧૧ મહિના સુધીનો સમય બાળક માટે ખૂબ જ નાજુક સમય હોય છે, કારણ કે આ દિવસોમાં બાળક વસ્તુઓને ખાતા શીખે છે અને પુરતું ભોજન લેવામાં અસમર્થ હોય છે.
- ૬ મહિનાનું બાળક ઘરમાં બનેલા પોચો ખોરાકને ગળી શકે છે. તેને દાત આવવાનું શરૂ થઈ જાય છે, જેનાથી તે કાપવાનો પ્રયત્ન કરે છે અને નાનો ખોરાક પચાવી શકે છે.
- ૯ મહિનાનું બાળક ઘરમાં બનલો ખોરાકના નાના ટુડકા જાતે ખાવા લાગી જાય છે.
- ૧૫ મહિનાનું બાળક ઘરમાં બનેતો ખોરાકથી પોતાની ભૂખ મીટાવી શકે છે.

એટલા માટે બાળકને ખોરાકમાં પોચ વસ્તુ આપવી જોઈએ, જેને બાળક સહેલાઈથી ગાળી શકે અને પચાવી શકે.

કાર્યકર્તા જ્યારે માતાને એ સલાહ આપે કે તેણે બાળકને ઉપરી આહારમાં શું - શું આપી શકાય છે, તો તેણે નીચેની બાબતોનું ધ્યાન રાખવું જોઈએ.

૧. સમર્થતા / સગવડ : આ જરૂરી છે કે માતાઓને એ જ ખોરાક લેવાની સલાહ આપો, જે તેનો કુટંબને પોશાય શકતો હોય,જો એવા ખાદ્ય પદાર્થો ખાવાની સલાહ આપવામાં આવે કે જેને માતા ને પોશાય શકતો ન હોય તો તેને કાર્યકર્તા પર વિશ્વાસ નહિ રહે.

૨. ખોરાકની ગુણવત્તા : માતાને એ સલાહ આપવી જોઈએ કે તે પોતાના બાળકને અલગ - અલગ પ્રકારનો, ઘટ, થોડા પોચો ઘરમાં બનાવવામાં આવતો ખોરાક, આના સિવાય બાળકને લીલાં પાંદવાળા શાકભાજી અને ઋતુ પ્રમાણે ફળ પણ આપવા જોઈએ

૩. ચોખ્ખું ભોજન : આમાં નીચેની વાતોનો સમાવેશ થાય છે.

- હાથ અને નખોની સફાઈ
- સાફ વાસણ
- સાફ ખાદ્યપ્રદાર્થ
- સાફ પાણી
- સાફ સ્થળ

ખોરાક અને પાણીને ઢાકીને રાખવું જોઈએ બનાવ્યા પછીના બે કલાકમાં ખાઈ લેવું જોઈએ. વાસણ અને હાથ સાબુથી ધોવા જોઈએ.

૪. ખોરાક વિશેની ખોટી માન્યતાઓ : ખાવાની વસ્તુઓ વિશે લોકોની કેટલીક પ્રકારની માન્યતાઓ અને ધારણા ચાલ્યા આવે છે, જેમ કે પ્રસૂતિ પછી આ વસ્તુ ખાવી જોઈએ અને આ ના ખાવી જોઈએ. દૂધ પીવડાવતા માતા અને બાળકની માટે આ ખોરાક "ગરમ" છે અથવા "ઠંડો" છે એટલે આ ખાવું જોઈએ અને આ ના ખાવું જોઈએ વગેરે. આ બધી વાતોને એકદમથી ના નકારો. એક વાર તમારા પર તેને વિશ્વાસ બેસી જાય, પછી આ ખોટી ધારણાઓને દૂર કરી શકાય છે.

યોગ્ય સમય પહેલા અથવા યોગ્ય સમય પછી ઉપરી આહાર શરૂ કરવાનું જોખમ

યોગ્ય સમય પહેલા ઉપરી આહાર શરૂ કરવાથી

- ઝાડા થઈ જવાનું જોખમ જાજું રહે છે, અને અન્ય બિમારીઓ પણ થવાની સંભાવના રહે છે.
- માતાના દૂધના સ્થાને ખોરાક આપવાથી, કે જે સામાન્ય રીતે ઓછો પૌષ્ટિક હોય છે, બાળકનો વજન વધવાનું બંધ થઈ જાય છે અને બાળક કુપોષિત થઈ જાય છે.

યોગ્ય સમય પછી ઉપરી આહાર શરૂ કરવાથી

- બાળકને જરૂરી પોષકતત્વો નથી મળતા.

- વિકાસ યોગ્ય રીતે નથી થતો અથવા અટકી જાય છે.
- લોહીની ઉણપ તથા કુપોષણનું જોખમ રહે છે.
- રોગ થવાની સંભાવના રહે છે.

સંપૂર્ણ આહાર

૬- ૯ મહિના

બાળકને શરૂઆતમાં ખાવાની નરમ વસ્તુઓ આપવી જોઈએ, જેને બાળક સહેલાઈથી ગળી શકે છે, જેમ કે રાબ, ખિચડી, મશળેલી શાકભાજી, ફળ જેવા કે કેળા, જેને મસળીને દૂધ માં બરાબર હલાવીને તથા માતાના દૂધ માં ઘટ કરી ને આપી શકાય છે. મસળેલા, બાફેલા બટાટાં, ઋતુ પ્રમાણે ફળ પણ આવી રીતે આપી શકાય છે.

યાદ રાખો :-બાળક જ્યારે ૬ મહિનાનું થાય, તેના માટે ઉપરી આહાર સારો છે. સૂપ, દાળ, ફળ, શાક ખવડાવો, સ્વસ્થ જીવન એને અપાવો

ઘણી માતાઓ પાસે એવો સમય નથી હોતો કે તે બાળક માટે ખાસ અને અલગથી ભોજન બનાવે.

ઘરમાં બનતા દાળ, ભાત અને શાકમાં મરચું કે મસાલો નાખ્યા વગર કાઢી લઈને પોચો કરી મસળી શકાય છે, તેમાં ઉપરથી દૂધ, તેલ કે ઘી તથા ખાંડ કે ગોળ નાખીને અને પછી બાળકને આપી શકાય છે. તેનાથી બાળકને તાકાત મળે છે.

રોટલીના નાના-નાના ટુકડા કરી તેને દૂધ માં પલાડી અને સારી રીતે મસળી ને આપી શકાય છે.

શરૂઆતમાં બાળક ખાવાનું મોઢાની બહાર કાઢી દે છે. પરંતુ એનો અર્થ એ નથી કે તેને ખાવાનું પસંદ નથી, તેને ફરીથી એજ વાનગી કોઈ બીજા સમયે એ આપી ખવડાવવાનો પ્રયત્ન કરી શકાય છે.

શરૂઆતમાં તેને એક - બે ચમચી જેટલું આપો ત્રણ - ચાર અઠવાડિયા પછી તેને ધીરે - ધીરે વધારીને અડધા કપ જેટલું કરી દો.

૭ - ૮ મહિનાના બાળકને બાફેલું ઈંડું મસળીને આપી શકાય છે. પછીથી આખું ઈંડું પણ આપી શકાય છે.

બાળક આ ઉમરે બેસવા લાગે છે. તેને દાંત આવવા લાગે છે અને તે બધી વસ્તુઓ મોઢામાં નાખવા લાગે છે. એટલા માટે તેને રોટલીના ટુકડા, ગાજર નો ટુકડો આપી શકાય છે. તે જાતે ખાય તે માટે તેને પ્રોત્સાહિત કરો.

બાળકને દિવસમાં ૨ - ૩ વાર ઉપરી આહાર આપો બાળકનું પેટ નાનુ હોય છે, અને એકવાર માં તે થોડી માત્રામાં જ ખાવાનું ખાઈ શકે છે.

ઉપરી આહારની સાથે સાથે સ્તનપાન ચાલુ રાખો.

૯-૧૨ મહિના

ઉપર બતાવેલા ખોરાકની માત્રા ધીમે - ધીમે વધારી શકાય છે. જે પરિવારમાં માંસ - માછલી ખવાય છે, તે લોકો તેનો કીમો બનાવીને બાળકને આપી શકે છે. આ ઉમરે મોટા ભાગના બાળકોને દિવસમાં ત્રણ - ચાર વાર ૩/૪ વાટકી ખોરાકની જરૂર પડે છે. સ્તનપાન ચાલુ રાખો.

૧-૨ વર્ષ

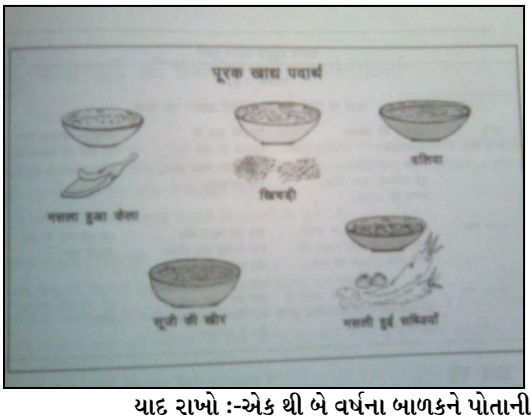
આ ઉમરે એવો પ્રયત્ન હોવો જોઈએ કે બાળક ઘરમાં બનતી બધી વસ્તુઓ ખાવા લાગે. ધીમે ધીમે ખોરાકની માત્રા વધારો. માંસ - માછલી ખાતા પરિવાર, બાળકને કીમો બનાવીને આપી શકે છે. આ ઉમરના બાળકને દિવસમાં પાંચ વાર દોઢ વાટકી ખાવાનું ખવડાવો. સ્તનપાન ચાલુ રાખો.

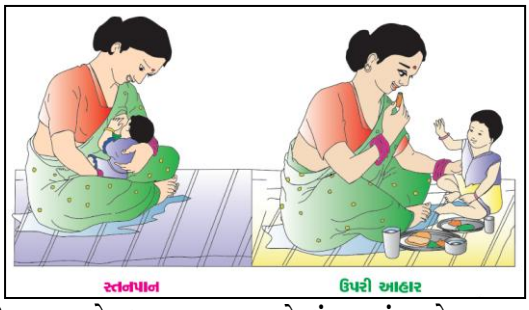
સ્તનપાન ચાલુ રાખવુ:

બાળકને કઈ પણ ખાવાનું આપો તેમાં આ બાબતો ધ્યાનમાં રાખો :

- ખોરાકમાં ઉપરથી તેલ, ઘી અથવા ખાંડ કે ગોળ નાંખો, જે વધારે શક્તિ દાયક હોય છે.
- લીલાં પાંદડાવાળા શાકભાજી પણ ભોજનમાં જરૂરી છે. જેનાથી લોહીની ઊણપ નથી થાતી.

યાદ રાખો :- બાળક માટે વિશેષ વસ્તુ ન બનાવો, તેન એ જ આપો જે તમે પોતે ખાવ છે





યાદ રાખો :-એક થી બે વર્ષના બાળકને પોતાની માતાના ખોરાકના અડધા ભાગ જેટલું ખાવાનું આપો

ધ્યાન રાખવાની બાબતો

બોક્સ ૧૩/૧ જમવા માટે આપવામાં આવતા ખોરાકની માત્રા			
ઉંમર	ખોરાકનો પ્રકાર	કેટલી વાર આપશે	પ્રમાણ / માત્રા દરેક વખતે
૬-૯ મહિના	દાળ, સારી રીતે મસાળેલાં શાકભાજી ફળ, કીમો, મસળેલો ખોરાક.	દિવસમાં બે-ત્રણ વાર તથા થોડી - થોડી વાર પછી સ્તનપાન.	બે-ત્રણ ચમચી ઘીમે - ઘીમે વધારીને દિવસમાં એક કપ ૨ થી ૩ વખત
૯-૧૨ મહિના	નાના-નાના ટુકડામાં અથવા મસળેલો ખોરાક અથવા એવો ખોરાક કે જે બાળક જાતે લઈને ખાઈ શકે.	ત્રણ વાર ભોજન અને વચમાં એક વાર નાસ્તો અને સ્તનપાન શરૂ રાખો.	એક કપ ૩ થી ૪ વખત
૧૨-૨૪ મહિના	ઘરમાં બનેલું ભોજન, જો જરૂર પડે તો મસળી ને અથવા નાના-નાના ટુકડા કરીને આપો.	ત્રણ વાર ભોજન તથા બે વાર નાસ્તો અને વચ્ચે વચ્ચે સ્તનપાન	દોઢ કપ અથવા વાટકો

યાદ રાખો :- પૂરતા પ્રમાણમાં સંપૂર્ણ ખોરાકની સાથે - સાથે સ્તનપાન બાળકમાં કુપોષણને અટકાવે છે

મુખ્ય સંદેશ

(જ્યારે તમે માતા અથવા પરિવારને મળો છો ત્યારે તેમને આ સંદેશ આપો)

૧. બાળકને બે વર્ષની ઉંમર સુધી સ્તનપાન શરૂ રાખવાથી તેને મજબૂત અને સ્વસ્થ બનાવવામાં મદદ મળે છે.
૨. જે બાળક ૬ મહિનાની ઉંમરથી પૂરક આહાર લેવાનું શરૂ કરી દે છે, તેમનો વિકાસ ખુબ સારી રીતે થાય છે.
૩. ઘટ્ટ અને નરમ ઘરેલું ખોરાક, જે સહેલાઈથી ચમચીમાં અટકતો હોય, તે બાળકનું પેટ ભરવા અને પોષણમાં મદદ કરે છે.
૪. બાળકો માટે પ્રાણી જન્ય ખોરાક, વિશેષ ખોરાક હોય છે.
૫. વટાણા, લીલા પાંદડાવાળા શાકભાજી, મસૂર અને શીંગ વગેરેમાં પોષકતત્વો વધારે હોય છે.
૬. વિટામીન "સી" થી ભરપૂર ખોરાક શરીરને લોહતત્વનો ઉપયોગ કરવામાં મદદગાર બને છે.
૭. લીલા પાંદડાવાળા શાકભાજી તથા નારંગી અને પીળા કલરના ફળ વિટામીન "એ" થી ભરપૂર હોય છે તથા બાળકોની આંખો સ્વસ્થ રાખવા તથા રોગો સામે રક્ષણ આપવમાં સહાયક બને છે.
૮. વૃદ્ધિ થતા બાળકને જલ્દી-જલ્દી ભોજન અને નાસ્તાની જરૂર હોય છે. તેમને વિવિધ પ્રકારનો ખોરાક આપો.
૯. વૃદ્ધિ થતા બાળકને વધતી જતી માત્રામાં ખોરાકની જરૂર હોય છે.

૧૪ આહારપૂર્તિની રીત અને કાર્યનીતિઓ

કાર્યકર્તા એટલા યોગ્ય હોવા જોઈએ કે તે માતાઓ તથા સંભાળ રાખનારાને સમજાવી શકે કે તેમણે પોતાના બાળક ની આહારપૂર્તિ કેવી રીતે કરવાની છે. બાળક ખોરાક ખાવાની રીત ધીમે - ધીમે શીખે છે બાળકને પ્રતિક્રિયાત્મક અને સક્રિય રીતે ખાવા શીખવાડવા માટે પ્રેરિત કરવા જોઈએ.

માતાને નીચે મુજબના ઉપાય આપો.

પ્રતિક્રિયાત્મક અને સક્રિય આહારપૂર્તિ :

- જ્યારે બાળકને જમાડતા હો, ત્યારે માતા અથવા સંભાળ રાખનાર વ્યક્તિ તેની પાસે હોય.
- બાળકનું ભોજન થાળીમાં અલગથી રાખો. પરિવારના અન્ય સભ્યો અને બાળકો તે ભોજનમાંથી કઈ પણ ના લેવુ.
- થાળીમાં એટલું ખાવાનું રાખો કે બાળક જ્યારે ખાઈ લે ત્યારે થાળી વાટકીમાં કંઈ ખાવાનું ના બચે.

બાળકને જમવા માટે કેવી રીતે પ્રોત્સાહિત કરી શકાય છે ?

- બાળકની સાથે વાતો કરો, તેની તરફ ધ્યાન આપો, તેનામાં રસ લો ધીરજ સાથે બેસો અને બાળકના જમવાનો આનંદ માણો.
- બાળકને જમવા માટે મજબુર ના કરવું જોઈએ.
- બાળકને ત્યારે જ ભોજન આપો જ્યારે તે ભૂખ્યુ હોય અને ભોજન માગતુ હોય, જો તે જમવાની ના પડે, તો તેને પછી જ્યારે તે ભૂખ્યુ હોય ત્યારે, જમાવા માટે પ્રોત્સાહિત કરો.
- બાળકને પૂરક આહાર આપતી વખતે જબરદસ્તી ના કરો.
- બાળકને પોતાની થાળી જોઈએ. બાળકને અલગ થાળીમાં ભોજન આપો. પ્લેટનો રંગ અને ડિઝાઈન આકર્ષક હોય, જેને બાળક પસંદ કરે, તેનાથી માતાને ખબર પડશે કે બાળકે કેટલું ખાધુ છે.
- બાળકને જાતે પોતાના હાથથી અથવા ચમચીથી ખાવાનુ કહો
- એક સમયે ફક્ત એક જ વસ્તુ ખવડાવો. એક જ સમયે બે-ત્રણ વસ્તુ આપવાથી બાળક કોઈ પણ વસ્તુ સારી ખાવાની ટેવ નહિ પાડી શકે.
- બાળકને ઘરમાં બનેલું મરચાં - મસાલા વગરનું ભોજન આપો.
- અલગ - અલગ પ્રકારનો પૂરક આહાર આપવાથી બાળકનો સ્વાદ વધે છે અને તેને ભોજન સારું લાગે છે

- જો બાળકને કોઈ ખાસ ભોજન પસંદ નથી, તો થોડા સમય માટે તે ખોરાક આપવાનો બંધ કરી દો અને થોડા દિવસો પછી પાછો આપો અથવા તેને કોઈ બીજો એવા ખોરાકની સાથે ભેળવીને આપો કે જે બાળકને પસંદ હોય.

તમે નાના બાળકોને જમવા માટે પ્રોત્સાહિત કરીને માતા અને પરિવારની મદદ કરી શકો છો.

નાના બાળકોને જમવા માટે પરિવારના સભ્યો કેવી રીતે પ્રોત્સાહિત કરી શકે છે

તેઓ નીચેની રીતે કરી શકે છે

- જ્યારે બાળક સંપૂર્ણ જાગ્રત અવસ્થામાં હોય અને ખુશ હોય, તે સમયે થોડા થોડા પ્રમાણમાં જમવાનું આપે.
- જો બાળક જમવામાં રસ દાખવે તો તેને વધારે જમવાનું આપો.
- એવો ખોરાક આપો, કે જે બહુ ઘટ્ટ પણ ના હોય કે બહુ પાતળો કે સૂકો પણ ના હોય.
- તેને નાની ચમચી આપો, ભોજન તેની નજીક રાખો, જમતી વખતે બાળકને ખોળામાં બેસાડો.
- સારી સારી બાતોથી પ્રોત્સાહિત કરો, જેમ કે " મોઢુ ખોલો, જમવાનું બહુ સ્વાદિષ્ટ છે. " પ્રસન્નતાથી જમાડો.

જો બાળકના જમવાના બદલે જમવાની ના પાડવા પર વધારે ધ્યાન આપે તો તે ભોજન ઓછું જમી શકે છે

જો બાળક બીમાર હોય તો તેને ખવડાવા - પીવડાવાં બહુ ધીરજની જરૂર પડે છે થોડી - થોડી વારે થોડું - થોડું ખવડાવો. તેને તેની પસંગીની વસ્તુ આપો અલગ અલગ પ્રકારના આહાર આપો અને સ્તનપાન કરાવવાનું શરૂ રાખો. સ્વાસ્થ્ય સારું થાય ત્યારે વધારે માત્રામાં વધારે પૌષ્ટિક આહાર આપો અને સ્તનપાન પણ વધારે કરાવો.

૧૫ શિશુઓ અને નાના બાળકોના સર્વોત્તમ આહારને કાયમ રાખવો

એક કાર્યકર્તાને રીતે તમારી ભૂમિકા માતાઓને સ્તનપાન અને પૂરક આહારની શિક્ષા દેવા સુધી જ સીમિત નથી, પરંતુ તમારા સમુદાયના બાળકો જ્યાં સુધી બે વર્ષ કે તેનાથી વધારે ઉમરના ના થઈ જાય, ત્યાં સુધી તમારે ખબર પણ રાખવાની છે અને માતાઓને સ્તનપાન અને પૂરક આહાર વિશે સલાહ, સહાયતા અને માર્ગદર્શન આપતા રહેવાનું છે તેનાથી તમે નક્કી કરી શકો છો કે માતાઓ બે વર્ષ કે વધારે સમય સુધી સ્તનપાન કરાવવાનું શરૂ રાખશે.

તમે જ્યારે પણ માતાને મળો

- તેની સારી વાતોને ધ્યાનમાં લો અને તેને પ્રોત્સાહન આપો.
- પરિસ્થિતિને અનુસાર બાળકના આહારપૂર્તિ પર જરૂરી જાણકારી આપો.
- માત્ર એક - બે ઉપાય પણ આપો.

કાર્યકર્તા કેવી રીતે શીશુઓ અને નાના બાળકોના સર્વોત્તમ આહારને કાયમ રાખી શકે છે ?

- *સ્તનપાન કરાવવા વાળી માતાઓની પ્રશંસા કરો.*
  સ્તનપાન કરાવવાનું ચાલુ રાખવા માટે તથા અન્ય માતાઓની સહાયતા કરવા માટે તેને પ્રોત્સાહિત કરો.
- *બાળકને બીજા વર્ષ સુધી સ્તનપાન કરાવતી માતાઓની પ્રશંસા કરો.*
- ૬ મહિનાની ઉમર પછી બાળકને ઘટ્ટ અને પોચો આહાર આપતી માતાઓના વખાણ કરો.
- *માતાઓને સૌથી વધારે સ્વસ્થ રીતે સ્તનપાન કરાવવામાં સહાયતા કરો.*
  ઉદાહરણ : માતાને કહો કે તે ૬ મહિના સુધી ફક્ત સ્તનપાન જ કરાવે, એવી પ્રથાઓને છોડવામાં તેની મદદ કરો કે જેનાથી સમસ્યાઓ ઉભી થતી હોય.
- *માતાઓને પ્રોત્સાહિત કરો કે તે ઉપરી આહાર શરૂ કરવાનો નિર્ણય લે તે પહેલા મદદ માટે આવે.*
  ઉદાહરણ :- જો તેને પોતાનું દૂધ ઓછું આવવા બાબત ચિંતા છે અથવા સ્તનપાન વિશે તેને કોઈ શંકા કે તકલીફ હોય.
- *જો યોગ્ય લાગે તો માતાને સ્તનપાન સમર્થન સમૂહની પાસે મોકલો.*
- *સ્તનપાન કરાવતી માતાઓને પરિવાર નિયોજન વિશે ઉપયોગી સલાહ આપો.* માતાઓને એ સમજાવો કે જ્યાં સુધી તેનું બાળક બે વર્ષ કે તેનાથી વધારે મોટું ના થાય ત્યાં સુધી બીજીવાર ગર્ભાધારણ ન થવાય.
- *૬ મહિનાથી મોટા બાળકોને સ્તનપાન કરાવતા રહેવાની સાથે - સાથે ઉપરી આહાર આપવાની રીત વિશે તેને ઉપયોગી માહિતી આપો.*
- *બાળક બિમાર થાય ત્યારે અને સ્વસ્થ થાય તે દરમિયાન પણ સ્તનપાન શરૂ રાખવા માટે માતાઓને પ્રોત્સાહિત કરો.*
- *તમે જ્યારે પણ કોઈ (સ્તનપાન કરાવતી માતા) ને મળો, તો તેને સ્તનપાન કરાવવા માટે સલાહ અને પ્રોત્સાહન આપો.*
  - પરિવાર નિયોજનની રીત અપનાવો.
  - બાળકના વિકાસ પર નજર રાખો. (ખાસ કરીને બાળકનું ઓછું વજન વધતું હોય)
  - પોષણની વિશે માહિતી પ્રાપ્ત કરો.
  - બાળકનું રસીકરણ કરાવો. (૯ મહિનાની ઉમરે ઓરીની રસી અપાવો)
  - ૬ મહિનાની ઉમર પછી પૂરક આહરની સાથે - સાથે સ્તનપાન શરૂ રાખો.
  - બિમાર બાળકની સારવાર અને દેખભાળ રાખો.
- *આવી મુશ્કેલ પરિસ્થિતિમાં પણ બાળકને ખોરાક આપવાનો શરૂ રાખવામાં માતાની સહાયતા કરો*

- માતાને બહાર કામ કે નોકરી ઉપર જવું છે.
- જોડિયાં બાળકો છે અથવા જન્મથી જ તેમનું વજન ઓછુ છે.
- જો માતા બિમાર છે.

- *બિમાર શીશુ અને નાના બાળકોની આહારપૂર્તિમા માતાની સહાયતા કરો.*
  - એક માતા દિવસમાં ૧૨ કે તેનાથી વધારે વાર સ્તનપાન કરાવી શકે છે.
  - જો બાળક સ્તન માંથી દૂધ નથી પી શકતું તો માતાને પોતાનું દૂધ કાઢવામાં અને બાળકને પીવડાવવામાં તેની મદદ કરો.

માતા ઘરેલૂ ખોરાક અથવા ઉપરી આહારની માત્રા વધારી શકે છે.

- *પોતાના સહકર્મીઓને જણાવો કે તમે શુ કરવાનો પ્રયત્ન કરી રહ્યા છો.*

જાણો કે બીજા ક્ષેત્રમાં કામ કરતા સહકર્મીઓ સર્વોત્તમ આહાર વિશે જાણે છે. જો તે માતા અને બાળકની દેખભાળના કાર્યમાં છે, તો તેનું સમર્થન લેવુ અને મદદ કે સહાયતા આપવાની પણ વાત કરવી.

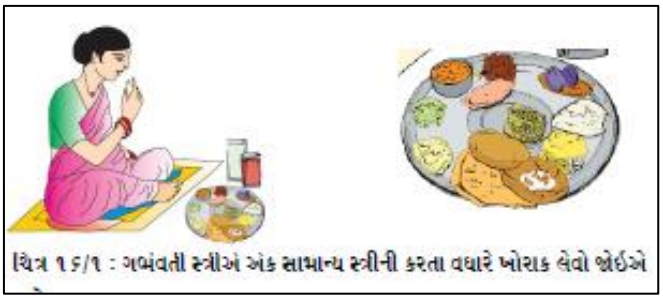
યાદ રાખો :-શિશુઓ અને નાના બાળકોને સ્તનપાન શરૂ રાખવા માટે માતાને સલાહ આપવી અને તેની મદદ કરવી ખૂબજ મહત્ત્વની છે.

૧૬ બહેનો માટે પૂરતો ખોરાક અને સ્વાસ્થ્ય

બહેનો માટે પોષણ તથા ખોરાક

ગર્ભાવસ્થા તથા સ્તનપાન ના સમય દરમ્યિાન આહાર વિશે સમાજને સાચી માહિતી આપવી તે એક કાર્યકર નું મહત્ત્વનુ કાર્ય છે. કાર્યકરને જોઈએ કે તે ગામમાં મળતો પૌષ્ટિક ખોરાક, લીલા પાદડાવાળાં શાકભાજી અને નારંગી તથા પીળા રંગના ફળો વિશે સલાહ આપે. તે પરિવારની પસંદ, નાપસંદગી પણ ધ્યાનમાં રાખે.

ગર્ભાવસ્થા તથા સ્તનપાન કરાવવાનો સમય એવો સમય છે જ્યારે એક સ્ત્રીએ પોતાના ભોજનમાં વિશેષ ધ્યાન આપવું જોઈએ. ગર્ભવતી માતાએ પોતાના માટે અને પોતાના પેટમાં રહેલા આવનાર બાળક માટે પણ ખાવું જોઈએ. આ સમયમાં શીશુ પોતાના વિકાશ માટે સંપૂર્ણ પોતાની માતા પર નિર્ભર હોય છે. એક ગર્ભવતી મહિલાનું વજન ૧૦-૧૨ કિલોગ્રામ જેટલું વધી જાય છે, જેનામાં ગર્ભ મા રહેલ શિશુનું વજન પણ ગણાતું હોય છે. આવું ત્યારે જ શક્ય બને છે, જ્યારે ગર્ભવતી સ્ત્રી ગર્ભમાં રહેલા શિશુને એ બધા જ પોષક તત્વો પ્રદાન કરે જે તેને પોતાના ખોરાકમાંથી પ્રાપ્ત થાય છે. આવી જ રીતે સ્તનપાન કરાવતી માતા પોતાના શિશુના વૃધ્યિ અને તંદુરસ્તી માટે તેને દૂધ પીવડાવે છે. તેના માટે જરૂરી છે કે માતા પૂરતા પ્રમાણમા પૌષ્ટિક ખોરાક અને પ્રવાહી લે, જે તેને તંદુરસ્ત રહેવામાં મદદ કરે છે.



ચિત્ર ૧૬/૧ : ગર્ભવતી સ્ત્રીએ એક સામાન્ય સ્ત્રીની કરતા વધારે ખોરાક લેવો જોઈએ

ગર્ભાવસ્થામાં જો માતાઓ પૂરતું ભોજન નથી લેતી, તો તેની અસર તેના બાળક પર પણ પડે છે. બાળક કા તો ઓછા વજનના જન્મે છે અથવા તે કુપોષિત રહેવાનો કાયમ ભય રહે છે.

આવી જ રીતે, સ્તનપાન કરાવતી માતાએ પણ પૂરતી માત્રામાં પોષક ખોરાક લેવો જોઈએ, જેનાથી તે સ્વસ્થ રહે અને પોતાના બાળકની પણ સારી રીતે દેખરેખ રાખી શકે.

યાદ રાખોઃ ગર્ભવતી અને સ્તનપાન કરાવતી માતાઓ માટે એ જરૂરી છે કે તે પુરતી માત્રામાં ખોરાક લે

ગર્ભાવસ્થા તથા સ્તનપાનના સમય દરમ્યિાન પોષક આહારને લગતી આવશ્યક વાતો

૧. ગર્ભાવસ્થા અને સ્તનપાનનો સમય - આ એવો સમય છે કે જ્યારે સ્ત્રી ને એક સામાન્ય સ્ત્રીની અપેક્ષા કરતા વધારે ખોરાકની જરૂરત હોય છે, કારણ કે તેને બે જીવોની જરૂરિયાતોનું ધ્યાન રાખવું પડે છે, પોતાનું તથા પોતાના ગર્ભસ્થ બાળકનું તથા પ્રસૂતિ પછી મોટા થતા બાળકનું.

૨. તેણે અનાજ, દાળો તથા શાકભાજી વધારે પ્રમાણમાં લેવા જોઈએ, તેણે સામાન્ય રીતે લેવાતા ભોજન કરતાં વધારે ખાવું જોઈએ. જો તે પોતાના સવાર - સાંજ અને રાત્રિના ભોજનમાં સામાન્યથી વધારે નથી ખાઈ શકતી તો તેણે થોડું - થોડું ભોજન થોડા - થોડા સમયના અંતરે ખાવું જોઈએ.

૩. તેણે મિશ્રિત ભોજન ખાવું જોઈએ, જેમા કે વિભિન્ન અનાજ ભેગું કરીને અથવા અનાજની સાથે દાળ કે શાકભાજી ભેળવીને લેવાથી એક જ વસ્તુમાંથી બધા જ પોષક તત્વો મળી રહે છે. જેમ કે - પૌષ્ટિક ખીચડી, જેમાં ચોખાની સાથે દાળ, જે કેલેરી અને પ્રોટીનનો સારો સ્ત્રોત છે. તેનામાં પાલક અને શાકભાજી જીણા - જીણા કાપીને મેળવી, પકાવી લેવાથી વિટામીન તથા ખનીજ દ્રવ્યો પણ મળે છે. ઉપરથી ૧ ચમચી તેલ કે ઘી કેલેરીમાં વધારો અને સ્વાદ પણ વધશે.

૪. તેણે દરરોજ પાદડાવાળા શાકભાજી ચોક્કસ ખાવા જોઈએ જે લોહીની પ્રાપ્તિ માટેનો સારો સ્ત્રોત છે. આનાથી તેને તથા તેના બાળકને લોહીની ઊણપ નથી રહેતી. ગર્ભવતી સ્ત્રી એ આયર્ન અને ફોલિક એસિડની ગોળીઓ, ગર્ભાવસ્થાના ૪ થી ૫ મહિના નિયમિત રૂપે લેતા રહેવી જોઈએ.

૫. સ્ત્રીને ગર્ભાવાસ્થા તથા સ્તનપાન કરાવવાના સમય દરમ્યાન વધારે શક્તિની જરૂરત પડે છે. તેણે તેલ અથવા ઘી પણ પૂરતી માત્રામાં લેવા જોઈએ, કારણ કે તેનાથી શક્તિ વધારે પ્રમાણમાં મળે છે. તેણે સાધારણ રીતે સામાન્ય સ્ત્રીની અપેક્ષા કરતા ૫૦૦ કેલેરી વધારે લેવી જોઈએ.
૬. માંસ, માછલી, ઈંડા, દૂધ અને ફળ વધારે લાભદાયક છે શાકભાજી તેની જગ્યાએ ફળો અને દાળોને વધારે પ્રમાણમાં અનાજની સાથે લઈ શકાય છે.
૭. દરરોજ ઋતુ પ્રમાણે ૧-૨ ફળ પોતાના ખોરાકમાં ચોક્કસ લેવા જોઈએ, જે શરીરને રોગપ્રતિકારક શક્તિ આપે છે.
૮. તેને દૂધ અને દૂધ ની બનાવટ વાળો ખોરાક અને પાણી વધારે માત્રામાં પીવું જોઈએ.
૯. બધી જ ગર્ભવતી અને ધવડાવતી માતાઓએ આયોડિન યુક્ત મીઠું વાપરવું જોઈએ, જે બાળકના માનસિક વિકાસ માટે ઉત્તમ છે તથા માતાને ગર્ભપાતથી બચાવે છે.

<u>સ્વાસ્થ્ય :</u>

<u>કાર્યકરએ</u> ગર્ભવતી માતાને જણાવવું કે તે :

- દિવસમાં બે કલાકનો આરામ ચોક્કસ કરે.
- બિમાર થાય તો ડોક્ટરની પાસે જાય.
- સમતોલ ખોરાક લે.
- પોતાની નિયમિત તપાસ કરાવે.
- આયર્ન - ફોલિક એસિડ ની ગોળીઓ ખાય. ગોળી તથા ભોજન લીધાના ૧ કલાક પહેલા અને ૧ કલાક પછી સુધી ચા કે કોફી ના પીવે.
- ચિંતા મુક્ત રહે.
- સ્તનપાન કરાવતી માતા જો બિમાર હોય તો બાળકને પણ પોતાની સાથે હોસ્પિટલ લઈ જાય.
- બિમારી અને હોસ્પિટલમાં દાખલ કરવામાં આવે તે દરમિયાન સ્તનપાન કરાવવાનું ચાલુ રાખવું જોઈએ.
- જો તે સ્તનપાન ન કરાવી શક્તી હોય, તો તે પોતાનું દૂધ કાઢીને બાળકને પીવડાવે (સ્વાધ્યાય ૧૦ જુઓ) કારણે કે તે સામાન્ય તાપમાનમાં પણ ખરાબ નથી થતું અને બે બાળકો વચ્ચે અંતર રાખવાનો સૌથી સરળ પ્રાકૃતિક ઉપાય છે . ડોક્ટર ની સલાહ જરૂર લે.
- જ્યારે તે સ્વસ્થ થઈ જાય ત્યારે તે પોતાના બાળકને થોડા - થોડા સમય પછી સ્તનપાન કરાવે.
- જો તે દવા લઈ રહી છે, તો પણ તે સ્તનપાન કરાવવા નું ચાલુ રાખી શકે છે.

યાદ રાખો :ગર્ભવતી તથા સ્તનપાન કરાવતી માતાઓ એ પોતાના ખોરાકમાં લીલા પાંદડાવાળા શાકભાજી લેવા જોઈએ, જે તેને લોહીની ઊણપને લીધે થતી બિમારીથી બચાવે છે.

<u>પ્રજનન ક્ષમતા :-</u>

<u>કાર્યકરએ</u> માતાને આ વાત કરવી જોઈએ :

- જે માતાને ફરીથી માસિક શરૂ થયું નથી અને તેનું બાળક ૬ મહિનાથી ઓછી ઉંમરનું છે અને તેને ફકત સ્તનપાન જ કરાવવામાં આવતું હોય, તો ફરીવાર ગર્ભધારણની સંભાવના ૨ પ્રતિશતથી પણ ઓછી હોય છે.
- માતાને ફરીથી માસિક શરૂ થઈ ગયું હોય અને તેનું બાળક ૬ મહિનાથી વધારે ઉંમરનું હોય અને તેણે પુરક આહાર લેવાનું શરૂ કરી દીધુ હોય તો તેને પરિવાર નિયોજન ની કોઈ અન્ય રીત અપનાવવાનો ઉપાય આપો.

૧૭ મહિલાઓ અને કામ

આજે વધારેમાં વધારે સ્ત્રીઓ કામકાજ કરી રહી છે. એટલે તે સ્તનપાન બંધ કરી દે છે, અને બાળકને પૂરક આહાર આપવાનું શરૂ કરી દે છે. એટલે કાર્યકર્તાઓએ નીચેના ઉપાય આપવા જોઈએ :

<u>કામ કરતી માતાઓ માટે ઉપાય</u>

જો શક્ય હોય તો બાળકને સાથે લઈ જાય (જ્યા કામના સ્થળની પાસે ક્રેશ (ઘોડીયા ઘર) ન હોય અથવા આવવા - જવા માટે સારી વ્યવસ્થા ન હોય તો મુશ્કેલી ઉદભવી શકે છે)

જો માતનું ઘર, કામના સ્થળથી નજીક હોય, તો વચમાં દૂધ પીવડાવવા માટે ઘરે આવી શકે છે, અથવા કોઈને કહીને બાળકને સ્તનપાન કરાવવા માટે બોલાવી શકે છે.

જો માતાનુ ઘર કામના સ્થળેથી દૂર હોય તો નીચેની રીતે બાળકને સ્તનપાન કરાવી શકે છે:

૧. પ્રસૂતિના સમયમાં બાળકને વધારે સ્તનપાન કરાવો

આનાથી બાળકને સ્તનપાનનો વધારે લાભ મળશે અને દૂધ નો પ્રવાહ પણ વધશે.

૨. જ્યાં સુધી જરૂરી ના લાગે, ત્યાં સુધી બીજા ભોજનની શરૂઆત ન કરો

માતા એવું ના વિચારે કે "અઢાર અઢવાડિયા પછી તેને ફરીથી કામ પર જવું પડશે એટલે બોટલથી દૂધ શરૂ કરી દે, બોટલનો ઉપયોગ બિલકુલ ના કરે. માતા બાળકને કપથી દૂધ પીવડાવી શકે છે. કામ પર પાછા જવાના એક અઠવાડિયા પહેલા બાળકને કપથી દૂધ પીવડાવવાનો અભ્યાસ કરી શકાય છે. બાળકની સાર - સંભાળ રાખવા વાળાને તેની આહારપૂર્તિ ની રીત બતાડો.

૩. રાત્રે, સવારમાં અને બીજા અન્ય સમયે જ્યારે માતા ઘર પર હોય, ત્યારે સ્તનપાન કરાવવાનું ચાલુ રાખવું

- આ રીતે માતા પોતાનુ દૂધ ચાલુ રાખી શકે છે.
- તેનાથી બાળકને માતાના દૂધના બધા લાભ મળે છે, અને માતા ઈચ્છે ત્યારે દિવસમાં ૧-૨ વાર ઉપરી દૂધ આપવાનો નિર્ણય કરી શકે છે.
- કેટલાક બાળકો રાત્રે સ્તનને વધારે ચૂસીને વધારે માત્રામાં પોતાની જરૂરીયાત પૂરી કરી લે છે. તે દિવસે વધારે સૂવે છે અને તેને દિવસે ઓછી માત્રામાં દૂધની જરૂર પડે છે.

૪. સ્તનમાંથી કાઢેલું દૂધ ઘર પર મૂકીને જાય :

પ્રસૂતિ પછી તરત જ સ્તનમાંથી દૂધ કાઢવાનું શીખી લેવું જોઈએ.

- દરરોજ પોતાના કામ પર જતા પહેલા સ્તનોમાંથી દૂધ કાઢીને એક સ્વચ્છ કપ અથવા વાડકીમા કાઢી લેવુ. કેટલીક માતાઓ વિચારે છે કે બાળકના સ્તનપાન કર્યા પછી પણ ૨ કપ અથવા વધારે દૂધ કાઢી શકે છે. પરંતુ, એક કપ દૂધ પણ બાળક ત્રણ વારમાં પીવે છે.
- સ્તનમાંથી કાઢેલા દૂધને સાફ કપડાથી અથવા પ્લેટથી ઢાંકવું જોઈએ.
- દૂધને ઠંડી જગ્યાએ અથવા ફ્રિજમાં રાખો. માતાનું કાઢેલું દૂધ ગાયના દૂધ કરતા વધારે સમય સુધી રાખી શકાય છે, કારણકે તેમાં સંક્રમણ - અવરોધી તત્ત્વ હોય છે. ગરમીમાં પણ ઓછામાં ઓછા ૮ કલાક સુધી દૂધ બગડતુ નથી.
- સ્તનમાંથી કાઢેલું દૂધ બાળકને પીવડાવતા પહેલા ફ્રિજમાંથી કાઢી લો અને અડધા કલાક સુધી રૂમના તાપમાનામાં રહેવા દો. દૂધ ને ઉકાળવુ કે ગરમ ન કરવું. ગરમ કરવાથી તેના અંદર રહેલા સંક્રમણ - અવરોધી તત્ત્વો નાશ પામે છે.

બાળકની સંભાળ રાખનારને સમજાવો કે કાઢેલું દૂધ બાળકને કેવી રીતે અપાય :

- સ્તનમાંથી કાઢેલા દૂધને સાફ કપ અથવા વાટકી મા રાખો. બાળકને કપથી જ પીવડાવો, બોટલન ઉંપયોગ ન કરવો.
- માતાને કહેવુ કે બાળકને ચૂપ કરાવવા માટે ચૂસણી ન આપવી.

જ્યારે માતા કામ પર હોય છે ત્યારે માતાએ સ્તનમાંથી દૂધ કાઢવાની જરૂર પડી શકે છે :

- જો માતા સ્તનમાંથી દૂધ નથી કાઢતી, તો માતાનો દૂધનો પ્રવાહ ઓછો થઇ જશે.
- સ્તનમાંથી દૂધ કાઢવા માટે માતાને યોગ્ય સ્થાન શોધવુ પડે છે.
- સ્તનમાંથી કાઢેલા દૂધને ફ્રિજમાં અથવા ઠંડી જગ્યામાં રાખી શકાય. ઢાકણ વાળા ડબ્બામાં માતા સ્તનમાંથી કાઢેલું દૂધ ને રાખી શકો છે. માતા પોતાના બાળક માટે દૂધ તેને ઘરે લઈ જઈ શકે છે, તથા તેને બીજા દિવસે પણ ઉપયોગ કરી શકો છો.

માતાનું દૂધ છે ઉત્તમ આહાર બધા બાળકોનો આ છે અધિકાર

૧૮ વિશેષ પરિસ્થિતિઓમાં સ્તનપાન

એક માતા પોતાના બાળકને બધી પરિસ્થિતિ ઓમાં સ્તનપાન કરાવી શકે છે. આમ છતા જો માતાને ગંભીર બિમારી હોય, ખાસ કરીને જો માતા કેન્સર વિરોધી અને થાયરોઇડ વિરોધી દવા લેતી હોય, ત્યારે કાર્યકરે માતાને સ્તનપાન શરૂ રાખવા માટે સ્વાસ્થ્ય કાર્યકર ની પાસે યોગ્ય માર્ગદર્શનના હેતુંથી મોકલવી જોઈએ.

વિશેષ પરિસ્થિતિમાં સ્તનપાન - એચ.આઇ.વી.

જો માતા એચ.આઈ.વી./એડઝ યુક્ત હોય, તો નવા જન્મેલા બાળકમાં એચ.આઈ.વી સ્તનપાન દ્વારા સંચારિત થઈ શકે છે. જો કોઈ માતા ને એચ.આઈ.વી હોય તો ત્યારે તમે તેની એચ.આઈ.વી. ની સ્થિતિને અનુસાર સલાહ આપી શકો છો.

૧. જો માતા ह्यूं.ट्ठ + (એચ.આઈ.વી. પોઝિટિવ) છે

તે માતાઓ માટે સ્તનપાન એ.એફ.એ.એસ.એસ માપદંડ પર આધાર રાખશે. એ.એફ.એ.એસ.એસ નો અર્થ છે, સ્વીકાર્યતા, વ્યાવહારિક, ખર્ચ ઉપાડવાની ક્ષમતા, ટિકાઉપણું અને સુરક્ષા છે.

સ્વીકાર્યતા

- માતાને પૂછો જો તે સ્તનપાન નથી કરાવતી, તો તેનો પરિવાર તથા સમાજ શું તેના આ નિર્ણયનો સ્વીકાર કરશે ?
- શુ તેના સ્તનપાન ન કરાવવાથી માતાની એચ.આઈ.વી. પોઝિટિવ હોવાની શંકા ઊભી થઈ શકે છે ?
- શુ લોકો દ્વારા તેની આલોચના કરવામા આવશે અને તેને કહેવામાં આવશે કે તે એક સારી માતા નથી, કારણ કે તે સ્તનપાન નથી કરાવતી.

વ્યાવહારિક

- શું માતા માટે એ શક્ય છે, કે ૬ મહિના માટે, દિવસમાં ૮-૧૦ વાર, દરેક વખતે નવો / તાજો ખોરાક તૈયાર કરે?
- શું તે સહેલાઈથી દૂધ, બળતણ, ખાંડ વગેરે મેળવી શકશે ?

ખર્ચ ઉપાડવાની ક્ષમતા

- શું તે દૂધ , બળતણ, વાસણ , ખાંડ, વિટામીન અને ખનીજ દ્રવ્યો ૬ મહિના માટે નિયમિત રીતે ખરીદી શકે તેમ છે ?
- શું તેની પાસે હાથ અને વાસણ સાફ કરવા માટે પૂરતા પાણીની સગવડ છે ?
- ટકાઉપણું
- શું પરિસ્થિતિ તેણે વગર મુશ્કેલીએ નિયમિત પૂરા સમય સુધી વૈકલ્પિક આહાર આપવા દેશે?

સુરક્ષા

- શું તેની પાસે પીવા યોગ્ય પાણી છે?
- શું તેની પાસે વાસણ સાફ કરવા અને વૈકલ્પિક આહાર સ્વચ્છતા પૂર્વક બનાવવા માટેની સુવિધા છે?
- શું તેની પાસે વૈકલ્પિક આહાર બનાવવા માટે જોઈતી કાચી સામગ્રી રાખવા માટેની સુરક્ષિત સુવિધા છે?

જો ઉપરના દરેક માપદંડનો જવાબ હા માં છે, તો વૈકલ્પિક ખોરાક આપી શકાય નહિતર ફકત સ્તનપાન માતા માટે એક યોગ્ય વિકલ્પ રહેશે.

આહારપૂર્તિની અન્ય રીતો

વૈકલ્પિક ખોરાકનો અર્થ બાળકને સ્તનપાનની જગ્યા એ આપવામાં આવતા પૌષ્ટિક ખોરાકથી છે, જેનાથી બાળકની જરૂરિયાતો પૂર્ણ થાય છે, જ્યાં સુધી તે પરિવારિક ખોરાક ન લઈ શકે.

નીચે મુજબનો વૈકલ્પિક ખોરાક આપી શકાય છે.

૧. જાનવરનું તાજું દૂધ (ગાય, ભેસ, બકરી, ઘેટુ અથવા ઊંટ)
૨. કૃત્રિમ દૂધ (ડબ્બાનું દૂધ)

સ્તનપાન વિકલ્પ

બાળકને સ્તનપાન અથવા તો સ્તનનું દૂધ કપ દ્વારા આપી શકાય છે . નીચે મુજબ વિકલ્પ હોઈ શકે છે.

૧ ૬ મહિના સુધી સ્તનપાન, ઘરમાં બનેલો ખોરાક બે વરસ કે તેથી વધારે ઉમર સુધી સ્તનપાનની સાથે આપી શકાય છે.
૨ ઓછા સમય માટે સ્તનપાન - બાળકને ૬ મહિના સુધી ફકત સ્તનપાન અને પછી સ્તનપાન બંધ કરી શકે છે. (૨ અઠવાડિયાની અંદર)
૩ ધાત્રી માતા - એચ.આઈ.વી. નહોય તેવી માતા, એચ.આઈ.વી. પોઝિટિવ માતાના બાળકને સ્તનપાન કરાવી શકે છે.
૪ એચ.આઈ.વી. પોઝિટિવ માતાના સ્તનમાંથી કાઢેલું, ગરમ કરેલુ દૂધ - આ દૂધ કપ દ્વારા આપવું જોઈએ.

જો કોઇ માતા સ્તનપાન કરાવવાનો નિર્ણય લે છે, અને એ.એફ.એ.એસ.એસ (AFASS)ના માપદંડ મુજબ નથી ચાલી શકતી, તેને સ્તનમાં પાકની સ્થિતિથી બચાવવા માટે બાળકને સાચી સ્થિતિમાં સ્તન સાથે વળગાડવાની રીત વિશે કહેવું જોઈએ. એવા સ્તનની દશા એચ.આઈ.વી. સંક્રમણના જોખમને વધારે છે. એચ.આઈ.વી. સંક્રમણ રોકવા માટે સ્તનપાન અને પ્રાણીનું દૂધ એક સાથે ન આપવું જોઈએ.

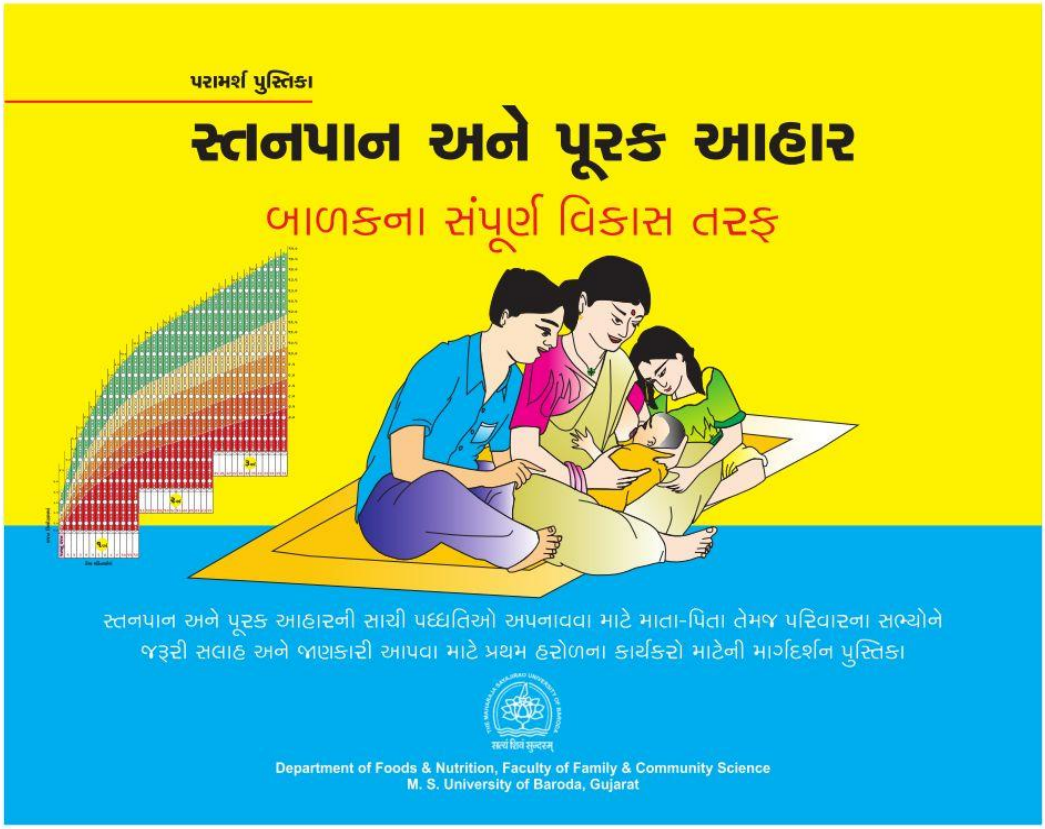
૨. જો માતાને એચ.આઈ.વી. ની સ્થિતિ વિશે ખબર નથી :-

સ્તનપાનની સલાહ ઉપર લખેલ મુજબ હોવી જોઈએ સ્તનપાનના ફાયદા વિશે માતાને કહેવું જોઈએ. સ્તનપાનની સાચી રીત અને બાળકને સ્તન સાથે વળગાડવા વિશે તેને સમજાવવું જોઈએ. તેને ૬ મહિના સુધી સ્તનપાનની સલાહ અને બે કે તેથી વધારે વર્ષ સુધી સ્તનપાનની સાથે ઘરમાં બનેલો ખોરાક શરૂ કરવાની સલાહ આપવી જોઈએ.

આફત ના સમય દરમ્યાન સ્તનપાન :-

કટો કટી ના સમય દરમ્યાન જેમ કે પ્રાકૃતિક આફત ભૂકંપ, અતિવૃષ્ટિ, યુધ્ધમા સ્તનપાન સૌથી સુરક્ષિત અને ફકત શિશુ અને નાના બાળકો માટે ભોજનનું સૌથી યોગ્ય અથવા સૌથી સારી રીત છે. તેને માતાના દૂધ અને સ્તનપાનનાં લાભો અને બોટલ ફીડિંગના નુકશાન વિશે સલાહ દેવી જોઈએ. માતાને સુરક્ષિત સ્થાન પર પહોચવા માટે સમર્થન આપવું જોઈએ, જ્યાં તે કોઈ પણ ભય કે ચિંતા વગર સ્તનપાન કરાવી શકે. અનુચીત પરિસ્થિતિઓ સિવાય દૂધ પાવડર માં વધારો ન કરો, કારણ કે તે સ્તનપાનને ઓછું અને સંક્રમણ અને મૃત્યુદરના જોખમને વધારે છે.

Annexure 4: Tools for Counseling on IYCF – Flip Charts



સ્તનપાન અને પૂરક આહાર - બાળકના સંપૂર્ણ વિકાસ તરફ

પ્રિય કાર્યકર્તા,

તમે એ વાત જાણતા જ હશો કે આપણાં દેશમાં દર વર્ષે હજારો બાળકો એક વર્ષની ઉંમર સુધીમાં કુપોષણનો શિકાર થઈ જાય છે. બાળકના વિકાસ ઉપર કુપોષણની ગંભીર અસર પડે છે. તમારા જેવા મહેનતુ અને જાગૃત કાર્યકર્તા માટે આ જરુરથી ચિંતાની એક બાબત હશે જ. પ્રશ્ન એ છે કે આ પરિસ્થિતીને કેવી રીતે બદલી શકાય? છેલ્લા ૧૦-૧૫ વર્ષમાં આ વિષય અંગે વૈજ્ઞાનિક રૂપે જે નવી બાબતોની જાણકારી મળી છે તેનું પાલન કરીને આપણે આ સ્થિતિને સુધારી શકીએ છે. આ માટે સૌથી જરૂરી છે બાળકોના આહાર અને પાલન-પોષણની યોગ્ય પધ્ધતિઓ.

જો આપણે બાળકને જન્મતાની સાથે જ માતાનું ધાવણ આપવાનું શરૂ કરી દઈએ, પહેલા છ મહિના સુધી ફકત માતાનું ધાવણ જ આપીએ અને ૬ મહિનાની ઉંમર પછી ઓછામાં ઓછા બે વર્ષની ઉંમર સુધી સ્તનપાન અને સાથે-સાથે ઉપરનો યોગ્ય આહાર આપવાનું શરૂ કરીએ, તો બાળકોમાં કુપોષણ ઘટાડી શકાય છે. આ માટે અત્યંત જરૂરી છે કે માતા અને કુટુંબના દરેક સભ્યોને આ અંગે સાચી અને પૂરેપૂરી જાણકારી હોય અને તેમને આ વાતનો વિશ્વાસ આવી જાય કે માતાનું ધાવણ પીવડાવવાથી બાળકને તંદુરસ્ત રાખી શકાય છે અને તે તેમના પોતાના જ હાથમાં છે. બાળકના વિકાસ માટેનું આ પહેલું પગલું છે.

સ્તનપાન અને શિશુ આહાર અંગેની બાબતોને પ્રચલિત કરવી એ એક પડકાર છે. આ જવાબદારી સફળ રીતે પૂરી કરવામાં આ પુસ્તિકા તમારી ભરપૂર મદદ કરશે. અગત્યનું એ છે કે તમે આ પુસ્તિકાનો પૂરેપૂરો અને વારંવાર ઉપયોગ કરો.

હાં, અને બીજી એક વાત કે, તમારા થકી તમારા વિસ્તારના તમામ બાળકોને સ્વસ્થ જીવનની શરૂઆતનો લાભ મળી રહયો છે. આ લાભ મેળવતાં દરેક બાળકના મા-બાપના આશિર્વાદના સાચા હકદાર પણ તમે જ છો. ફકત તમે જ.

આ પુસ્તિકા એટલા માટે બનાવવામાં આવી છે કે તમે માતા તેમજ પરિવાર અને બીજા સભ્યોને સ્તનપાન અને ઉપરના આહાર અંગેની જરુરી જાણકારી આપી શકો અને માતાને કેટલીક સરળ પણ મહત્ત્વની બાબતોનું પાલન કરવા માટે તૈયાર કરી શકો. આ પુસ્તિકા તમને નીચે જણાવેલી બાબતો માટે સહાયક બનશે.

- માતા-પિતા તેમજ પરિવારના અન્ય સભ્યો સાથે શિશુ આહાર અને વિકાસ અંગે વાતચીત કરવા માટે.
- માતાનું ધાવણ ક્યારથી શરૂ કરવું જોઈએ ?
- બાળકને કેટલા મહિનાની ઉંમર સુધી ફકત સ્તનપાન આપવું જોઈએ?
- ક્યારે અને કેવા પ્રકારનો ઉપરનો આહાર શરૂ કરવો જોઈએ?
- ઉપરી આહાર ક્યારે, કેટલો અને કેટલી વખત આપવો?
- બાળકને સ્તનપાન ક્યાં સુધી કરાવતા રહીશું?
- માતાનું ધાવણ ક્યાં સુધી આપવું જોઈએ?
- બાળકની પાલન-પોષણની રીતો.

3

દરેક વ્યક્તિને જાણકારી હોવી જોઈએ કે...

ગર્ભાવસ્થા દરમ્યાન દરેક સ્ત્રીને પૂરતો અને યોગ્ય ખોરાક અને આરામ મળવો જોઈએ. આ સમયે માતાએ પોતાના આવનારા બાળકના વિકાસ અંગે જાણકારી મેળવવી જોઈએ. માતાએ બાળકને ધાવણ આપવાનું ક્યારે શરૂ કરવાનું છે અને કેટલા સમય સુધી ધાવણ ચાલુ રાખવાનું છે ? આ બાબતો અંગે આ જ સમય દરમ્યાન નિર્ણય કરી લેવામાં આવે તો માતા તથા બાળક બંને માટે તે ખૂબ જ લાભદાયક સિધ્ધ થઈ શકે છે. જન્મના પહેલા ૬ મહિના સુધી બાળકને ફકત માતાના ધાવણની જ જરૂરિયાત હોય છે અને તેમાંથી જ તેને એ બધુ જ મળી રહે છે જે બાળકના માનસિક અને શારીરિક વિકાસ માટે જરૂરી છે. ૬ મહિના પછી બાળકને માતાના ધાવણની સાથે-સાથે ઘરમાં બનતો ખોરાક જેમ કે છૂંદેલા ફળ, શાકભાજી, અનાજ વગેરે આપવા જોઈએ. બે વર્ષ કે તેથી વધુ ઉંમર સુધી બાળકને ઘરમાં બનતા ખોરાકની સાથે-સાથે માતાનું ધાવણ આપવું જોઈએ.

મહત્તવના નિર્ણયો :

- ⇨ ગર્ભાવસ્થા દરમ્યાન પૂરતો ખોરાક અને આરામ
- ⇨ નવજાત શિશુને જન્મના પહેલા જ કલાકમાં સ્તનપાન
- ⇨ જન્મથી ૬ મહિના સુધી ફકત સ્તનપાન
- ⇨ સાતમાં મહિનાથી બે વર્ષ કે તેથી વધુ ઉંમર સુધી પૂરક આહારની સાથે-સાથે સ્તનપાન

4

આ પુસ્તિકાનો ઉપયોગ કરવાની રીત

આ પુસ્તિકા શા માટે છે ?

૧ આ પુસ્તિકા માતા તેમજ કુટુંબના અન્ય સભ્યો સાથે વાતચીત કરતી વખતે તમારા માટે ખૂબ જ ઉપયોગી સાબિત થશે. જ્યારે તમે વાત કરો છો ત્યારે સગર્ભા સ્ત્રી, બાળકના માતા-પિતા, સાસુ તેમજ ઘરની અન્ય મોટી વ્યક્તિઓ અને મોટા બાળકોને સાથે રાખીને વાત કરો.

૨. આ પુસ્તિકાનો ઉદેશ્ય છે કે દરેક વ્યક્તિને સ્તનપાન તેમજ પૂરક આહાર વિશે સાચી માહિતી આપવામાં આવે અને તેના થકી તેમનો સહયોગ સુનિશ્ચિત કરવામાં આવે, જેથી કરીને આ કાર્ય તેઓની ભાગીદારી થકી સફળતાપૂર્વક થઈ શકે.

આ પુસ્તિકાનો ઉપયોગ ક્યારે કરશો ?

૧ ગર્ભવતી મહિલાઓ, નવજાત શિશુની માતાઓ, બે વર્ષ સુધીના બાળકની માતાઓ સાથે વાતચીત કરવા માટે

૨ મમતા દિવસે જ્યારે તમે મહિલા મંડળમાં વાતચીત કરતા હો તે સમયે પણ આ પુસ્તિકાનો ઉપયોગ કરી શકાય છે.

૩ આ પુસ્તિકા દરેક સમયે ઉપયોગી છે. જેમકે બાળક જો ૬ મહિનાનનું થઈ ગયું છે તો માતા સાથે ફકત પૂરક આહાર અંગેની વાતચીત કરો. માતાને ફરીથી મળતી વખતે યાદ કરાવો કે આગળની મુલાકાતમાં શું વાત કરવામાં આવી હતી.

ક્યારે, શું વાત કરશો ?

૧ ગર્ભાવતી મહિલાઓને તથા નવજાત શિશુની માતાઓને પહેલા ૬ મહિના સુધી ફકત સ્તનપાન તેમજ સ્તનપાનની શરૂઆત અને સ્તનપાન કરાવવાની સાચી રીત વિશે જણાવો. (પાના. : ૮ થી ૨૭)

૨ જ્યારે બાળક પાંચ મહિનાનું થઈ જાય ત્યારે માતાને જણાવો કે ૬ મહિના પૂરા થાય પછી બાળકને પૂરક આહાર આપવાનું પણ શરૂ કરવાનું છે.(પાના. : ૨૮ થી ૩૫)

ઉપયોગ કરવાની રીત :

- ☞ બહેનોને અર્ધ ગોળાકાર (Semi Circle)માં બેસાડો અને તમે થોડી ઊંચી જગ્યા ઉપર, વચ્ચે બેસો.
- ☞ ચિત્ર બતાવતી વખતે પેન અથવા તો પેન્સિલનો ઉપયોગ કરો.
- ☞ આ પુસ્તિકાને તમે ચાહો તો હાથમાં ઉંચે ઉઠાવીને દેખાડી શકો છો.
- ☞ એ બાબતનું ખાસ ધ્યાન રાખો કે ચિત્રો અર્ધવર્તુળાકારે બેઠેલી બહેનો તરફ રહે અને લખાણ તમારા તરફ રહે.
- ☞ બધાને પૂછો કે તેમને ચિત્રો બરાબર દેખાય છે કે કેમ ? ત્યારબાદ જ પુસ્તિકાનો ઉપયોગ શરૂ કરો.
- ☞ ચિત્રોની પાછળના ભાગમાં, સરળ ગુજરાતી ભાષામાં તમારે માતાને શું પૂછવાનું છે, શું વાત કરવાની છે તથા બેઠક કેવી રીતે આગળ વધારવાની છે તે અંગેની માહિતી આપવામાં આવી છે.
- ☞ આ પુસ્તિકાનો ઉપયોગ કરવા માટે ત્રણ રંગોનો ઉપયોગ કરવામાં આવ્યો છે જે નીચે જણાવેલી બાબતો દર્શાવે છે :

■ જે પ્રશ્ન પૂછવાનો છે.	**તમારે પૂછવાનું છે**	જ્યારે તમે કુટુંબના સભ્યો સાથે વાત કરતા હોય ત્યારે ધ્યાન રાખો કે પીળા રંગમાં લખવામાં આવેલ છે તે તમારો પ્રશ્ન છે. વાદળી રંગમાં લખેલી વાત તમારે જાતે/પોતે કરવાની છે અને ગુલાબી રંગમાં આપેલી માહિતી છે જે તમારે આપવાની છે.
■ જે તમારે જાતે કરવાનું છે.	**તમારે જાતે કરવાનું છે**	
■ જે માહિતી તમારે આપવાની છે.	**માહિતી જે આપવાની છે**	

5

4

બેઠકને સફળ બનાવવા માટે નીચેની બાબતો ઉપર ખાસ ધ્યાન આપો.

૧ બેઠક દરમ્યાન પ્રશ્નો પૂછતા રહો. સવાલ-જવાબ દ્વારા દરેક લોકો બેઠકમાં સાચા અર્થમાં રસ લેતા થાય છે. આ ઉપરાંત જે વાત આપણે સમજાવવી છે તે વાત તેઓ સરળતાથી સમજી શકે છે અને તેમને યાદ પણ રહી જાય છે. આ ઉપરાંત તમને પણ એ વાતની ખબર પડે છે કે સમસ્યા બાબતે એ લોકો શું વિચારે છે અને શું કહે છે.

૨. એ વાત પણ શકય છે કે બેઠક દરમ્યાન માતા દ્વારા કરવામાં આવતી કેટલીક સારી બાબતોની પણ તમને જાણકારી મળે. તો આ બાબતો અંગે જરૂરથી પ્રશંશા કરો. આમ કરવાથી માતાનો આત્મવિશ્વાસ વધે છે.

૩ તમારી વાત સરળ શબ્દોમાં સમજાવો.

૪ બેઠક દરમ્યાન વચ્ચે-વચ્ચે પ્રશ્નો પૂછતા રહો. આમ કરવાથી તમને એ વાતનો ખ્યાલ આવશે કે તમારી વાતને લકો કેટલી હદે સમજી રહ્યા છે ?

૫ માતા સાથે વાતચીત કરતી વખતે એ જરૂરી નથી કે તમે એટલું જ બોલો જે આ પુસ્તિકામાં છાપવામાં આવ્યું છે. પરંતુ તમે તમારા અનુભવો, જાણકારીનો ઉપયોગ સ્થાનિક ભાષા, રૂઢિપ્રયોગો, ઉદાહરણો સાથે કરી શકો છો. ધ્યાન એ બાબતનું રાખવાનું છે કે આ પુસ્તિકામાં આપવામાં આવેલા સંદેશાઓ લોકો સુધી સાચી રીતે પહોંચે.

૬ બેઠક દરમ્યાન વચ્ચે-વચ્ચે કે છેલ્લે લોકોને પ્રશ્ન પૂછવા માટે કહો, આ પ્રશ્નોના જવાબ આપવા માટે એ ખૂબજ જરૂરી છે કે તમને એ વિષય અંગે પૂરતી જાણકારી હોય.

૭. આ પુસ્તિકા દ્વારા લોકોને સમજાવતી વખતે દરેક વાતચીત એકદમ મિત્રતાના ભાવ સાથે કરો તથા એ વાતની પણ કોશિષ કરો કે :

- લોકો સુધી પૂરેપૂરી જાણકારી પહોંચે
- મુખ્ય સંદેશાઓને વારંવાર કહેવામાં આવે
- તેમની ખોટી માન્યતાઓ અને ખોટી સમજણ દૂર થાય.

6

અનુક્રમ

7

ગર્ભાવસ્થા દરમ્યાન પૂરતો આહાર અને આરામ

8 કાર્ડ : ૧

પુષ્ન, ગર્ભવતી મહિલા અને ધાત્રીમાતા માટે સમતોલ આહાર

10 કાર્ડ : ૨

ગર્ભાવસ્થા દરમ્યાન પૂરતો આહાર અને આરામ

બેઠક દરમ્યાન અથવા તો એકાંતમાં સગર્ભા અથવા તો સંભવિત સગર્ભાને પૂછો.

પ્ર. : શું તમે ગર્ભવતી છો ?

❖ ગર્ભવતી મહિલા સાથે ૫ થી ૧૦ મિનિટ સુધી ગર્ભાવસ્થા દરમ્યાન જરૂરી આહાર વિશે વાત કરો. મહિલા શું કહે છે તે ધ્યાનથી સાંભળો અને તેની સાચી બાબતોની પ્રશંશા કરો

સગર્ભાની વાત ધ્યાનથી સાંભળો પછી તેને સમજાવો :

- ગર્ભવતી મહિલાનું વજન સરેરાશ ૧૦ થી ૧૨ કિ.ગ્રા જેટલું વધે છે. જેમાં આવનાર બાળકના વજનનો પણ સમાવેશ થઈ જાય છે.
- ગર્ભાવસ્થા દરમ્યાન માતાએ પોતાના માટે તેમજ ગર્ભમાં રહેલા બાળક માટે વધારે માત્રામાં (દોઢગણી માત્રામાં) ખોરાક લેવો જોઈએ.
- ગર્ભવતી મહિલાએ સમતોલ આહાર લેવો જોઈએ જેમાં વિવિધ પ્રકારના અનાજ, દાળ,તેલ, દૂધ, ફળ અને શાકભાજીનો સમાવેશ થતો હોય
- ગર્ભવતી મહિલાએ પોતાના રોજંદા ભોજનમાં દરરોજ ઋતુ પ્રમાણે મળતા લીલાં પાંદડાવાળા શાકભાજી જરૂરથી લેવા જોઈએ.
- આહારમાં ઋતુ પ્રમાણે મળતા ફળોનો પણ સમાવેશ કરવો જોઈએ.
- ઈંડા તેમજ માંસ-માછલી લેવા પણ ફાયદાકારક છે.
- રસોઈમાં ફક્ત આયોડીનયુક્ત મીઠું જ હંમેશા વાપરવું.
- ગર્ભાવસ્થા દરમ્યાન નિયમિત દાકતરી તપાસ કરાવો તથા ધનુરની રસી નિયત સમય મુજબ મુકાવો.
- ગર્ભવતી મહિલાએ ગર્ભાવસ્થાના છેલ્લા ત્રણ મહિના દરમ્યાન આયર્ન અને ફોલિક એસિડની ગોળીઓ નિયમિત રીતે લેવી જોઈએ.
- દિવસમાં, ખાસ કરીને ગર્ભાવસ્થાના છેલ્લા ત્રણ મહિના, થોડા થોડા સમયના અંતરે આરામ કરવો જોઈએ. દિવસ દરમ્યાન ઓછામાં ઓછા બે કલાક આરામ કરવો જોઈએ.
- વધુ શ્રમ પડે તેવું શારીરિક કામ ન કરવું જોઈએ.
- સંસ્થાકિય સુવાવડની વ્યવસ્થા અગાઉથી નક્કી કરી રાખો.

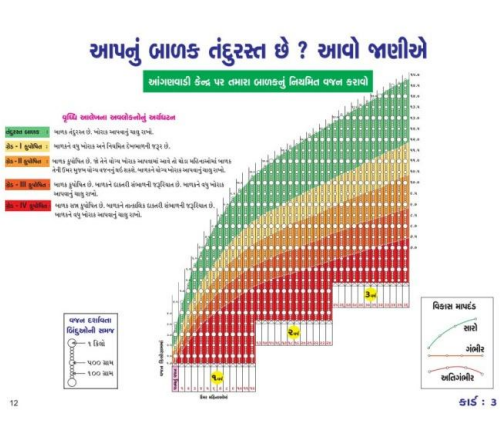
9

પુષ્ન, ગર્ભવતી મહિલા અને ધાત્રીમાતા માટે સમતોલ આહાર

ખોરાક	પુષ્ન મહિલા માટે આહારની જરુરી માત્રા	ગર્ભવતી મહિલા માટે આહારની જરુરી માત્રા	ધાત્રીમાતા માટે આહારની જરુરી માત્રા
અનાજ	૩૦૦ ગ્રામ/દિવસ	૩૦૦ ગ્રામ + ૩૫ ગ્રામ/દિવસ	૩૦૦ ગ્રામ + ૬૦ ગ્રામ/દિવસ
દાળ	૪૦ ગ્રામ/દિવસ	૪૦ ગ્રામ + ૧૫ ગ્રામ/દિવસ	૪૦ ગ્રામ + ૩૦ ગ્રામ/દિવસ
લીલાપાંદડાવાળા શાકભાજી	૧૦૦ ગ્રામ/દિવસ	૧૦૦ ગ્રામ/દિવસ	૧૦૦ ગ્રામ/દિવસ
અન્ય શાકભાજી	૫૦ ગ્રામ/દિવસ	૫૦ ગ્રામ/દિવસ	૫૦ ગ્રામ/દિવસ
કંદમૂળ	૫૦ ગ્રામ/દિવસ	૫૦ ગ્રામ/દિવસ	૫૦ ગ્રામ/દિવસ
ફળ	૧૦૦ ગ્રામ/દિવસ	૧૦૦ ગ્રામ/દિવસ	૧૦૦ ગ્રામ/દિવસ
દૂધ	૨૦૦ ગ્રામ/દિવસ	૨૦૦ ગ્રામ + ૧૦૦ ગ્રામ/દિવસ	૨૦૦ ગ્રામ + ૧૦૦ ગ્રામ/દિવસ
ખાંડ અને ગોળ	૨૦ ગ્રામ/દિવસ	૨૦ ગ્રામ + ૧૦ ગ્રામ/દિવસ	૨૦ ગ્રામ + ૧૦ ગ્રામ/દિવસ
તેલ અને ચરબી	૧૫ ગ્રામ/દિવસ	૧૫ ગ્રામ/દિવસ	૧૫ ગ્રામ + ૧૦ ગ્રામ/દિવસ

Formulations based on recommended dietary allowences of ICMR (1989)

11



આપનું બાળક તંદુરસ્ત છે ? આવો જાણીએ

પ્ર : તમારુ બાળક તંદુરસ્ત છે કે કેમ તે યોગ્ય રીતે વધી રહ્યું છે કે શું, તે તમે કેવી રીતે નક્કી કરો છો ?

❖ માતા તથા બાળકની સંભાળ રાખનાર અન્ય વ્યક્તિને વૃધ્ધિ આલેખના બિંદુ, રંગ અને રેખાની દિશા સમજાવવી જેથી તેઓ વૃધ્ધિ આલેખના આધારે બાળકના વિકાસને સમજી શકે અને જરૂર જણાય ત્યારે યોગ્ય ફેરફાર કરી શકે.

૧. વૃધ્ધિ થતી હોય તે બાળક સ્વસ્થ છે. વૃધ્ધિ ન થાય તે બાળક અસ્વસ્થ છે.
૨. ૩ વર્ષ સુધી બાળકોની વૃધ્ધિ જલ્દીથી થાય છે.
૩. બાળકોની વૃધ્ધિ ઘણી બધી રીતે માપી શકાય છે, જેમ કે તેની ઊંચાઈ વધવાના કારણે કપડા નાના પડવા, વગેરે પરંતુ વૃધ્ધિ માપવાનો સૌથી સરળ ઉપાય તેનું વજન વધવું તે છે.
૪. દર વખતે બાળકનું વજન કરીને ઉંમર પ્રમાણે વજન વૃધ્ધિ આલેખ પર યોગ્ય બિંદુ ભરી દર્શાવવામાં આવે છે.
૫. વૃધ્ધિ આલેખમાં ત્રણ પ્રકારના બિંદુઓ છે.
– નાના બિંદુ ૧૦૦ ગ્રામ વજન સૂચવે છે.
– મધ્યમ બિંદુ ૫૦૦ ગ્રામ વજન સૂચવે છે.
– મોટા બિંદુ ૧૦૦૦ ગ્રામ વજન સૂચવે છે.
૬. વજન કર્યા બાદ બાળકની તંદુરસ્તી બે માપદંડના આધારે નક્કી કરવામાં આવે છે.
અ) વજન દર્શાવતું બિંદુ વૃધ્ધિ આલેખના કયા રંગમાં આવે છે.
✓ જો બિંદુ લીલા રંગમાં હોય તો બાળક તંદુરસ્ત છે.ખોરાક આપવાનું ચાલુ રાખો.
✓ જો બિંદુ પીળા રંગમાં હોય તો બાળક કુપોષિત છે.બાળકને નિયમિત દેખભાળની જરૂર છે.
✓ જો બિંદુ આછો કેસરી રંગમાં હોય તો બાળક કુપોષિત છે. જો તેને યોગ્ય ખોરાક આપવામાં આવે તો થોડા મહિનાઓમાં તેની ઉંમર મુજબ યોગ્ય વજનનું થઈ શકશે. બાળકને યોગ્ય ખોરાક આપવાનું ચાલુ રાખો.
✓ જો બિંદુ ઘાટા કેસરી રંગમાં હોય તો બાળક અતિ ગંભીર કુપોષિત છે.બાળકને દાકતરી સંભાળની જરૂરિયાત છે.બાળકને વધુ ખોરાક આપવાનું ચાલુ રાખો.
✓ જો બિંદુ લાલ રંગમાં હોય તો બાળક અતિ ગંભીર કુપોષિત છે.બાળકને તાત્કાલિક દાકતરી સંભાળની જરૂરિયાત છે. બાળકને વધુ ખોરાક આપવાનું ચાલુ રાખો.
બ) વૃધ્ધિ રેખાની દિશા : ભરેલા બિંદુઓને એક રેખાથી જોડી દેવામાં આવે છે તે રેખાને વૃધ્ધિ રેખા કહેવામાં આવે છે.
✓ ઉપરની દિશા તરફ જતી વૃધ્ધિ રેખા દર્શાવે છે કે બાળકનું ઉંમર પ્રમાણે વજન બરાબર છે જેથી જાણી શકાય છે કે બાળકની વૃધ્ધિ બરાબર થઈ છે અને બાળક સ્વસ્થ છે.
✓ સીધી વૃધ્ધિ રેખા દર્શાવે છે કે બાળકનું વજન વધ્યું નથી તેથી આંગણવાડી કાર્યકર અને માતાએ બાળકનું વિશેષ ધ્યાન રાખવું જરૂરી છે.
✓ નીચેની દિશા તરફ જતી વૃધ્ધિ રેખા દર્શાવે છે કે બાળકનું વજન ઘટ્યું છે તેથી આંગણવાડી કાર્યકર અને કુટુંબીજનોએ બાળકના વિકાસ પર ધ્યાન રાખવુ ખુબ જ જરૂરી છે.
૭. કુટુંબીજનોએ ચોક્કસાઈ રાખવી જોઈએ કે,
✓ બાળકને દર મહિને વજન કરવા માટે નિયમિત આંગણવાડી કેન્દ્રમાં લઈ જવામાં આવે.
✓ વૃધ્ધિ રેખાની દિશાઓ શું દર્શાવે છે તે બરાબર સમજી કાર્યકરની સાથે બાળકની સંભાળ વિશે ચર્ચા કરવામાં આવે.
✓ બાળકની પહેલાંની અને હાલની બિમારી વિશે કાર્યકરને જાણકારી આપવામાં આવે.
✓ બાળકને ખોરાક આપવાની બાબતે, તેની સંભાળ રાખવાની બાબતે અને બિમારીના સમયે ધ્યાન રાખવાની બાબતે આંગણવાડી કાર્યકરની સલાહ લેવામાં આવે અને તેનું પાલન કરવામાં આવે.

❖ વજનમાં વધારો ન થવાના કે ઓછા પ્રમાણમાં થવાના મુખ્ય બે કારણો હોય છે. જે નીચે મુજબ છે.
૧. બાળકને જરૂરી પ્રમાણમાં ખોરાક આપવામાં આવેલ નથી કે તેની યોગ્ય સંભાળ રાખવામાં આવેલ નથી અથવા ૨.બાળક બિમાર છે.
❖ બાળક યોગ્ય પ્રમાણમાં ખોરાક લેતું થઈ જાય અથવા તે બિમારીમાંથી સાજુ થઈ જાય ત્યારે તેની વૃધ્ધિ થવા લાગે છે.
બાળકને આપવામાં આવતા ખોરાક વિશે માતાને પૂછો. વર્તમાન સમયમાં કે ભુતકાળમાં બાળકને જો કોઈ બિમારી થઈ હોય તો તેના વિશે જાણકારી મેળવો. બાળકની સાથે પરિસ્થિતિનો અંદાજ મેળવીને જરૂરી સંભાળ લેવાની સલાહ મમતા કાર્ડ અને આ પુસ્તિકા મુજબ આપો.

13

નવજાત શિશુને જન્મના પહેલા જ કલાકમાં ધવડાવો

પ્ર : આ ચિત્રમાં તમે શું જોઈ રહ્યા છો ?

❖ લોકોને જવાબ આપવા દો, ત્યારબાદ તમે જણાવો કે આ ચિત્રમાં માતા, કે જેણે હમણાં જ બાળકને જન્મ આપ્યો છે તે નવજાત શિશુને ધવડાવી રહી છે. નર્સબહેન પણ ત્યાં જ હાજર છે.

પ્ર : માતાનું ધાવણ શરૂ કરતા પહેલા નવજાત શિશુને તમે શું આપો છો ?

❖ પૂછો અને જાણો. પછી સમજાવો કે નવજાત શિશુને માતાના ધાવણ સીવાય અન્ય કોઈ પણ ચીજ આપવી જોઈએ નહીં. તે શિશુ માટે નુકસાનકારક હોય શકે છે.

પ્ર : શું તમે જાણો છો કે નવજાત શિશુને જન્મના પહેલા જ કલાકમાં ધવડાવવાથી શું શું ફાયદા થાય છે ?

લોકોની વાત સાંભળો. પછી તેમને સમજાવો :-

❖ તમારા શિશુને જન્મના પહેલા જ કલાકમાં ધવડાવવાનું શરૂ કરી દો.
❖ આમ કરવાથી માતાને જલ્દીથી ધાવણ આવે છે. ત્યાર પછી બાળક જયારે માંગે ત્યારે ધવડાવો.
❖ આમ કરવાથી માતા અને બાળક વચ્ચેનો લાગણીનો સંબંધ વધુ મજબુત બને છે.
❖ આનાથી મેલી (Placenta) ઝડપથી બહાર આવી જાય છે અને લોહી પડવાનું પણ ઓછું થઈ જાય છે. પૂછો અને જાણો. પછી સમજાવો કે નવજાત શિશુને માતાનું ધાવણ શરૂ કરતા પહેલા કોઈ પણ ચીજ આપવી જોઈએ નહી કારણ કે તે નુકસાનકારક હોય શકે છે.

- આમ કરવાથી તમારું દૂધ સારી રીતે અને વધારે માત્રામાં આવશે.
- તમારા શિશુને તમારું પહેલું ઘાટું ધાવણ (જેને કોલોસ્ટ્રમ કે ખીરું કહે છે) મળશે જે,
  – શિશુના પેટ અને આંતરડાને સાફ કરે છે
  – પોષક તત્ત્વોથી ભરપૂર હોય છે
  – તમારા બાળકને ઘણા રોગો સામે રક્ષણ આપે છે
  – વિટામીન-'એ' થી ભરપૂર હોય છે.
  – સ્તનપાન શરૂ કરતા પહેલા શિશુને જન્મ ઘૂંટી, ગળથૂંથી, ગોળનું પાણી, મધ કે પછી ખાંડનું પાણી જેવી કોઈપણ ચીજ પીવડાવશો નહીં. પાણી પણ નહીં.

15

સ્તનપાનના અનેક ફાયદાઓ

બેઠકમાં કે પછી એકલતા મહિલાને પૂછો,

પ્ર : તમારામાંથી કેટલા લોકોના બાળકો ૬ મહિનાથી નાની ઉંમરના છે ?

પ્ર : તમે બાળકને આહારમાં શું આપો છો ?

પ્ર : તમારું ધાવણ આપવાથી તમારા બાળકને, તમને અને તમારા પરિવારને શું ફાયદાઓ થાય છે ?

❖ સમૂહમાંથી એવી મહિલાઓને પસંદ કરો જે ૬ મહિનાથી નાની ઉંમરના બાળકોને ફક્ત સ્તનપાન જ કરાવતી હોય અને પછી તેમને પૂછો.

❖ પાંચ મિનિટ સુધી વાત કરો. શું જવાબો મળે છે તેને ધ્યાનપૂર્વક સાંભળો. જે લોકોએ સાચા જવાબો આપ્યા છે તેને શાબાશી આપો અને પછી સમજાવો.

- તમારું ધાવણ આપવાથી **તમારા બાળકને** થતા ફાયદાઓ
  - પહેલા ૬ મહિના સુધી સંપૂર્ણ પોષણ મળે છે અને બે વર્ષ સુધી યોગ્ય પ્રમાણમાં જરૂરી આહાર, તાકાત અને પોષક તત્ત્વો મળે છે.
  - ધાવણ સહેલાયથી પચી જાય છે.
  - તમારા બાળકને દમ, એલર્જી, ઝાડા અને ન્યૂમોનિયા જેવા રોગોથી બચાવે છે
  - બાળકના મગજના વિકાસને ઝડપી બનાવે છે
  - તમારા અને બાળક વચ્ચે પ્રેમ વધારે છે.
- તમારું ધાવણ આપવાથી **તમને** થતા ફાયદાઓ
  - બાળકના જન્મ પછી તમારું લોહી વહી જતું અટકાવે છે.
  - બાળકના જન્મ પછી થતી લોહીની ઊણપ સામે રક્ષણ આપે છે.
  - તમારો આત્મવિશ્વાસ વધારે છે.
  - બીજા બાળકના જન્મ વચ્ચે અંતર રાખવામાં તમને મદદરૂપ થાય છે.
  - તમને સ્તન અને ગર્ભાશયના કેન્સર સામે રક્ષણ મળે છે.
- તમારું ધાવણ આપવાથી **તમારા પરિવારને** થતા ફાયદાઓ
  - બાળક માટે બજારમાંથી લાવવા પડતા આહારમાં થતો ખર્ચ બચાવે છે.
  - આ તૈયાર કરવા માટે તમારે બળતણ કે વાસણની જરૂર પડતી નથી.

17

જન્મના પહેલા ૬ મહિના સુધી ફક્ત સ્તનપાન

પ્ર : આ ચિત્રમાં માતા શું કરી રહી છે ? જવાબ મળે પછી સમજાવો.

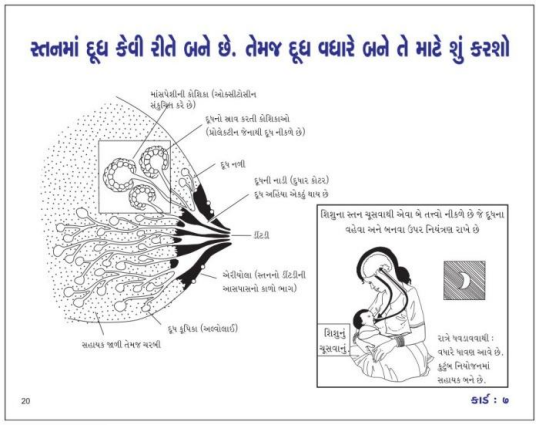
❖ અન્ય કુટુંબીજનો સાથે વાત કરો અને તેમની મદદ માંગો કે ફક્ત સ્તનપાન કરાવવા માટે માતાને પ્રોત્સાહિત કરે.

- કુટુંબીજનોને કહો કે માતાને ધાવણ શરૂ કરવામાં મદદ કરો. બાળકને બીજું કાંઈ પણ ન પીવડાવો.
- જેમ કે ગોળ કે સાકરનું પાણી, ગળથૂંથી, મધ અને પાણી પણ નહીં.
- તમારા બાળકના સંપૂર્ણ વિકાસ માટે તમારું ધાવણ જ પૂરતું છે.
- તમારુ બાળક તમારા સ્તનને વારંવાર ચૂસશે તો વધારે ધાવણ આવશે. વારંવાર ધવડાવવાથી વધુ માત્રામાં દૂધ ઉત્પન્ન થાય છે.
- કેટલી વખત ધવડાવશો : ૨૪ કલાકમાં ઓછામાં ઓછું ૮ થી ૧૦ વખત ધવડાવો. આમ કરવાથી વધારે માત્રામાં ધાવણ આવશે.
  રાત્રે પણ સ્તનપાન કરાવવું જોઈએ. આમ કરવાથી ધાવણની માત્રા વધશે.
- ધવડાવતી વખતે શિશુ સાથે પ્રેમથી વાતો કરતા રહો. આમ કરવાથી શિશુના મગજનો વિકાસ સારો થાય છે.
- ૬ મહિના સુધી માતાના ધાવણમાંથી બાળકને સંપૂર્ણ આહાર મળી રહે છે. જેમાં ખોરાક, પાણી તેમજ બીમારી સામે રક્ષણ પૂરું પાડવા માટેના બધાજ જરૂરી તત્ત્વો હોય છે. તમારા શિશુ માટે આનાથી વધારે ઉત્તમ બીજું કાંઈ પણ નથી એટલા માટે ૬ મહિના સુધી તમારા બાળકને ફક્ત તમારું ધાવણ જ પીવડાવો.

યાદ રાખો :

- ૬ મહિના સુધી તમારા બાળકને ધાવણ સીવાય બીજું કાંઈ પણ ન આપશો. કેમ કે ધાવણમાં તમારા બાળક માટે જરૂરી બધાજ પૌષ્ટિક તત્ત્વો ઉપરાંત પાણી પણ છે. એટલા માટે ઉનાળામાં કે ગરમીના સમય દરમ્યાન પણ બાળકને પાણી પણ ન પીવડાવશો. આ ઉપરંત જન્મ પછી બાળકને જન્મ ઘુટ્ટી, અન્ય દૂધ, ગોળ કે સાકરનું પાણી મધ કે ગળથૂથી ન પીવડાવશો.
- ધવડાવતી વખતે એક બાબતનું ખાસ ધ્યાન રાખો કે પહેલા એક તરફના સ્તનનું બધુ જ ધાવણ પૂરેપુરું ખલાસ થાય પછી જ બીજી તરફના સ્તનનું ધાવણ આપો. આમ કરવાથી તમારા બાળકને સંપૂર્ણ પૌષ્ટિક દૂધ મળશે. આ માટે ૧૫ થી ૨૦ મિનીટ સુધી એક જ સ્તનનું ધાવણ આપો.
- બોટલનો ઉપયોગ કરવાથી આપનું બાળક સ્તનને ચૂસવાનું ભૂલી શકે છે અને બોટલ દ્વારા દૂધ પીવડાવવાથી બીમારી પણ થઈ શકે છે.

19



સ્તનમાં દૂધ કેવી રીતે બને છે તેમજ દૂધ વધારે બને તે માટે શું કરશો

પ્ર : શું તમે જાણો છો કે સ્તનમાં દૂધ કેવી રીતે બને છે ?

❖ દૂધ સ્તનમાં આવેલી ગ્રંથીઓમાં ઉત્પન્ન થાય છે અને નળીઓ દ્વારા સ્તનમાંથી બહાર આવે છે જેથી કરીને બાળક જ્યારે ચૂસે ત્યારે તેના મોઢામાં આવે.

આનું મહત્ત્વ એ છે કે માતાનું ધાવણ બાળકના ચૂસવાથી જ બને છે.

પ્ર : તમે તમારૂં ધાવણ કેવી રીતે વધારી શકો છો ? થોડી વાર સાંભળો પછી સમજાવો.

❖ ઝડપથી વિકાસ પામતા શિશુઓ વધુ વખત ધાવણ માંગે છે. જો તે વધુ વખત સ્તન ચૂસશે તો વધુ ધાવણ આવશે. એટલા માટે મનમાં એ શંકા ન હોવી જોઈએ કે શિશુ માટે ધાવણ ઓછું છે.

❖ જેમ કે પહેલું જ વાત કરી તેમ તમારૂં ધવણ બનવાનો આધાર શિશુના સ્તન ચૂસવા ઉપર છે. જો તમે તમારા ધાવણની માત્રા વધારવા માંગતા હોતો વારંવાર ધવડાવો રાત્રે પણ અચૂક ધવડાવો. બાળક જેટલી વખત માંગે તેટલી વખત ધવડાવો.

❖ તમારા મનમાં કોઈ શંકા કે ચિન્તા હોય તો પ્રશ્ન પૂછીને તેને દૂર કરો.

❖ ધાવણ આવવાનું તમારા મનની સ્થિતિ ઉપર પણ આધારિત છે. તમારો આત્મવિશ્વાસ મજબૂત રાખો. આમ કરવાથી ધાવણની માત્રા વધશે.

❖ બીજા લોકોને આ વાત કરો અને તેમનો સહયોગ મેળવો.

❖ થોડો વખત રાહ જોઈને પછી આ ચિત્ર વિશે પૂછો. આ ચિત્ર ઉપરથી તમને શું સમજાય છે ?

❖ જ્યારે તમારૂં બાળક સ્તન ચૂસે છે તો દૂધ બનવાની પ્રક્રિયા શરૂ થઈ જાય છે.

❖ માતા તથા કુટુંબીજનોને જણાવો કે બાળક સાથે હસો, રમો અને વાતો કરો. આમ કરવાથી બાળકના મગજ અને બુધ્ધિનો વિકાસ સારો થાય છે.

❖ જો બાળક દિવસમાં ૬ થી ૮ વખત પેશાબ કરે અને તેનું વજન દર મહિને ૫૦૦ ગ્રામ જેટલું વધે તો સમજો કે તમારૂં ધાવણ પૂરતું છે.

- બાળકને બીજુ કાંઈ પણ ન આપો, જેમ કે ગોળ કે સાકરનું પાણી, જન્મ ઘુટ્ટી, મધ વગેરે કાંઈ પણ ન આપો. જન્મ પછી તરત જ સ્તનપાન શરૂ કરાવો.
- બાળકોને બોટલ ક્યારે પણ ન આપશો.

21

બાળકને સ્તનપાન માટે લેવાની સાચી રીત

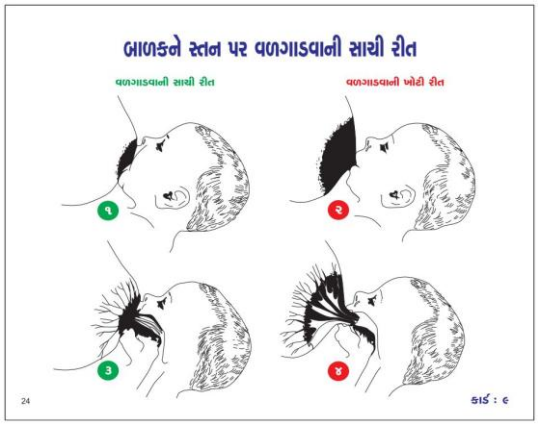
પ્ર : બાળકને કઈ સ્થિતિમાં દૂધ પિવડાવવાનું તમને ફાવે છે.

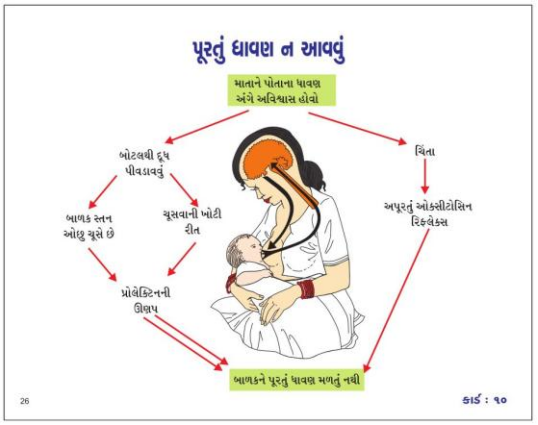
❖ વાતચીત કરો અને કોઈ શંકા હોય તો તેનું સમાધાન કરો.

ચર્ચા દરમ્યાન સમજાવો :

- યોગ્ય રીતે સ્તનપાન કરાવવા માટે બાળકને લેવાની અને વળગાડવાની રીત ખુબજ અગત્યની છે.
- સારી રીતે લેવામાં આવેલ
  - બાળકનું માથું, ગરદન અને પીઠ સીધાં હોય
  - બાળકનું શરીર માતાના શરીરથી ખુબ નજીક હોય, બાળકનું મોઢુ સ્તનની સામે હોય, નાક ડીટડી સામે હોય અને બાળકના આખાયે શરીરને આધાર મળતો હોય (માત્ર ગરદન અને ખભાને જ નહી).
  - બાળકને દૂધ પિવડાવતી વખતે તેને માથા પર દબાણ ન થવું જોઈએ.
  - બાળકને દૂધ પિવડાવતી વખતે માતા તેને પ્રેમથી જુએ.

23





બાળકને સ્તન પર વળગાડવાની સાચી રીત

પ્ર : શું તમને ખબર છે બાળકને સ્તન પર વળગાડવાની સાચી રીત શું છે ?

❖ વાતચીત કરો અને કોઈ શંકા હોય તો તેનું સમાધાન કરો.

ચર્ચા દરમ્યાન સમજાવો.

– માતાને બતાવો કે બાળકના મોઢામાં સ્તન આપતી વખતે સ્તનને પોતાના હાથ વડે સહારો આપે.
– બાળકને સ્તન પર વળગાડવા માટે કેવી રીતે પાસે લેવું તે માતાને સમજાવો.

વળગાડવાની સાચી રીત (ચિત્ર ૧ અને ૩)

– બાળકની દાઢી સ્તનને સ્પર્શતી હોય કે ખૂબ નજીક હોય
– બાળકની મ્હોંફાડ ખૂબ પહોળી હોય
– બાળકનો નીચલો હોઠ બહારની તરફ વળેલો હોય
– સ્તનની ડીંટડીની આસપાસની ઘેરી ચામડીનો ઉપરનો હિસ્સો બાળકની મ્હોંફાડની બહાર વધુ દેખાતો હોય
● આ ચારેય લક્ષણો જોવા મળે તો જ બાળક સારી રીતે વળગેલું કહેવાય.
● જો બાળક સારી રીતે વળગેલ ના હોય કે ચૂસતું ના હોય તો તેને કોઈ ગંભીર બિમારી હોઈ શકે અને તેને તાત્કાલિક સારવારની જરૂર છે.

વળગાડવાની ખોટી રીત (ચિત્ર ૨ અને ૪)

– બાળકની દાઢી સ્તનથી દૂર હોય
– બાળકની મ્હોંફાડ પહોળી ન હોય
– નીચલો હોઠ અંદર વળેલો હોય, કે ડીંટડીની આસપાસની ઘેરી ચામડી મ્હોંફાડની નીચે વધુ દેખાય કે આ ભાગ ઉપર અને નીચે સરખા ભાગમાં દેખાય. આ સ્થિતિમાં ચૂસવાથી બાળકને ધાવણ પૂરેપુરું પહોંચતું નથી અને તમને ડીંટડી આસપાસ દુઃખાવો પણ થઈ શકે છે.

25

પૂરતું ધાવણ ન આવવું

પ્ર : આ ચિત્રમાં તમને શું દેખાય છે ?

❖ લોકોને જવાબ આપવા દો. ત્યારબાદ તમે જણાવો કે આ ચિત્રમાં એ બાબતો દર્શાવવામાં આવી છે જેના કારણે માતા મોટાભાગે એવું વિચારવા લાગે છે કે તેનું ધાવણ બાળક માટે પુરૂ પડતું નથી.

પ્ર : બાળકનું ખુબ જ રડવાનું કારણ મોટે ભાગે શું સમજવામાં આવે છે ?

❖ લોકોને જવાબ આપવા દો. ત્યારબાદ તમે સમજાવો કે બાળકના વધારે રડવાને કારણે માતાને પોતાનું ધાવણ પૂરતું આવે છે એ વિશ્વાસ ઓછો થવા લાગે છે, પરંતુ મોટાભાગે બાળક સ્તનને સાચી રીતે ચૂસી શકતું નથી અથવા તો પૂરેપુરૂં ચૂસી શકતું નથી અને એ જ કારણસર રડે છે. કુટુંબીજનોના કહેવાથી માતા ઉપરી આહાર (મોટાભાગે બોટલ દ્વારા દૂધ) આપવાનું શરૂ કરી દે છે.

આ કારણે બાળક સ્તનપાન ઓછુ કરી દે છે અને એજ ઓછું ધાવણ આવવા માટેનું મુખ્ય કારણ છે.

પ્ર : માતાનો આત્મવિશ્વાસ વધારવામાં તમે શું મદદ કરી શકો ?

❖ લોકોના જવાબ સાંભળો, પછી એ લક્ષણો જણાવો જેના દ્વારા જાણી શકાય છે કે બાળકને પૂરતું ધાવણ મળે છે કે નહીં.

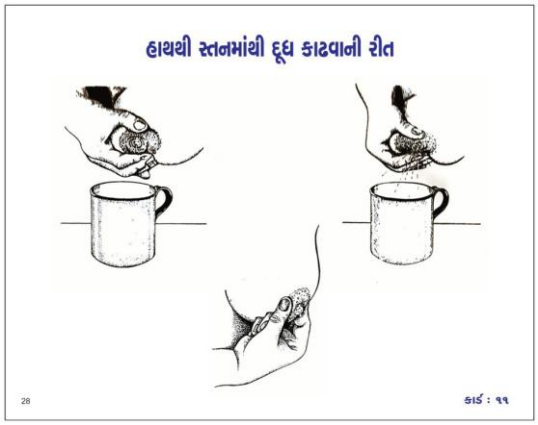
આ બાબતોથી સ્પષ્ટ થાય છે કે બાળકને પૂરતું ધાવણ મળે છે કે નહિં. જો બાળકનું વજન યોગ્ય પ્રમાણમાં વધી રહ્યું હોય તથા યોગ્ય માત્રામાં પેશાબ થતો હોય તો માતાને વિશ્વાસ અપાવવો કે તેને બાળક માટે જરૂરી માત્રામાં પુરતું ધાવણ આવે છે.

બાળકને ધાવણ પૂરતું મળે છે કે નહી તે દર્શાવતા લક્ષણો

વિશ્વાસ પાત્ર લક્ષણો

● વજનમાં ઓછો વધારો	૧. એક મહિનામાં ૫૦૦ ગ્રામથી ઓછું.
	૨. બે અઠવાડિયા પછી જન્મ સમયના વજન કરતા ઓછું વજન હોવું
● ઓછી માત્રામાં ઘાટો પેશાબ આવવો	૧. દિવસમાં ૬ વખતથી ઓછી વખત
	૨. પીળો તેમજ તીવ્ર દુર્ગંધ ધરાવતો પેશાબ

27



હાથથી સ્તનમાંથી દૂધ કાઢવાની રીત

પ્ર : શું ક્યારેય તમારે તમારા સ્તનમાંથી દૂધ કાઢવાની જરૂરિયાત ઊભી થઈ છે.

❖ શું જવાબ આપવામાં આવે છે તે સાંભળો. ત્યારબાદ સમજાવો કે નીચે જણાવેલી પરિસ્થિતિઓમાં તેમણે ઘણી વખત તમારા સ્તનમાંથી દૂધ કાઢવું પડી શકે.

- સ્તન ખૂબ ભરાય જાય ત્યારે
- સ્તનપાન યોગ્ય રીતે ન કરી શકે તેટલું શિશુ બીમાર હોય ત્યારે
- ઓછું વજન ધરાવતા તથા નબળા નવજાત શિશુ માટે, કારણ કે તે સ્તનપાન કરવા માટે અસમર્થ છે અને તેને કપથી દૂધ પીવડાવવું પડે તેમ હોય ત્યારે
- માતા બીમાર હોય અને બાળકને ધવડાવી શકે તેમ ન હોય ત્યારે
- જે શિશુને ચૂસવાની અને ગળે ઉતારવાની પ્રક્રિયામાં તકલીફ પડતી હોય અથવા બાળક ધાવતું ન હોય ત્યારે
- અંદર તરફ જતી રહેલી હોય તેવી ડીંટડીના કારણે બાળક ચૂસવાનું શીખી ન શકે ત્યારે
- જ્યારે માતા ક્યાંય બહાર ગઈ હોય ત્યારે ધાવણને સ્તનમાંથી વહી જતું અટકાવવા માટે
- શિશુને ઘરે મૂકીને કામ પર જતી માતાઓ માટે
- ડીંટડી કે કાળાભાગને સૂકાય જાય કે દુઃખાવો થતો અટકાવવા માટે

હાથથી દૂધ કાઢવું

- તમારા હાથને સારી રીતે ધુવો.
- આરામદાયક સ્થિતિમાં બેસો કે પછી ઊભા રહો.
- સ્વચ્છ, ધોયેલા કપ કે વાસણને સ્તનની નજીક રાખો.
- અંગુઠો ડીંટડી અને કાળાભાગની ઉપર અને પહેલી આંગળી ડીંટડીની નીચે રાખો (ચિત્ર જૂઓ) બાકીની આંગળીઓ વડે સ્તનને પકડીને દબાવો.
- દબાવો અને ઢીલું મૂકો, ફરથી દબાવો અને ઢીલું મૂકો આમ વારંવાર કરો. થોડીવારમાં દૂધ ટપકવાનું શરૂ થશે.
- સ્તનને ચારે તરફથી દબાવો જેથી દરેક તરફથી દૂધ બહાર આવે.
- એક સ્તનમાંથી ૩ થી ૫ મિનિટ સુધી ત્યારબાદ બીજા સ્તનથી ૩ થી ૫ મિનિટ સુધી દૂધ કાઢો ત્યારબાદ ફરીથી આ ક્રમ પ્રમાણે કરો.

માતાનું દૂધ ૮ કલાક સુધી બગડતું નથી. તેને સાફ વાસણમાં ઘરમાં ક્યાંય પણ તમે રાખી શકો છો.

29

૬ મહિના પછી બાળકને શું-શું આપવું?

પ્ર : તમારા મતે બાળકને માતાના ધાવણની સાથે-સાથે ઉપરનો આહાર ક્યારથી આપવાનું શરૂ કરવું જોઈએ ?

❖ લોકોને બે ત્રણ મિનિટ સુધી પોતાની વાત કહેવા દો.

- શિશુ ૬ મહિનાનું થાય ત્યારબાદ તેને માતાના ધાવણની સાથે-સાથે ઉપરી આહાર આપાવાનું શરૂ કરવું જોઈએ કારણ કે હવે ફક્ત ધાવણ બાળકના પોષણ એ શક્તિની જરૂરિયાત ને પુરી કરી શકતું નથી.

પ્ર : આ ચિત્રમાં તમને શું દેખાય છે ?

પ્ર : ઘરમાં ક્યો ખોરાક સહેલાયથી બને છે જે બાળકને આપી શકાય ?

❖ સાંભળો અને બતાવો. જવાબ સાંભળ્યા પછી સમજાવો.

- પહેલા ચિત્રમાં માતા તેના બાળકને ધવડાવી રહી છે. બીજા ચિત્રમાં માતા પોતાના બાળકને ખવડાવી રહી છે.
- તમારુ બાળક જ્યારે ૬ મહિના પૂરા કરી લે ત્યારે તેને સ્તનપાન ઉપરાંત ધીમે-ધીમે ઘરમાં બનતો પોંચો, ચોળેલો ખોરાક જેમ કે રાંધીને ચોળેલી શાકભાજી, બટેટું, ખીચડી, રાબ વગેરે ખવડાવો. અનાજ અને ફળોનો ઉપયોગ કરો પાકેલું કેળું કે પપૈયું પણ આપી શકાય છે. મોટાભાગે ઘરમાં બનતો ખોરાક જ બાળકને ખવડાવો.
- બાળકને એક વખતે એક વાટકી દિવસમાં ત્રણ વખત ખવડાવો. એ બાબતનો ખ્યાલ રાખો કે આહાર પાણી જેવો પાતળો હોવો જોઈએ નહીં.
- ખાવાની દરેક વસ્તુને એક-એક કરીને આપવાનું શરૂ કરો, બધી જ વસ્તુને એક જ દિવસે આપવાનું શરૂ ન કરી દો.

31

બે વર્ષની ઉંમર સુધી સ્તનપાન, સાથે-સાથે ઉપરી આહાર

પ્ર : આ ચિત્રમાં તમને શું દેખાય છે ?

❖ આ ચિત્રમાં બાળક અલગ થાળીમાં, માતાની દેખરેખ હેઠળ જમી રહયું છે. આ ઉપરાંત માતા બાળકને ધવડાવે પણ છે.

– તમારા બાળકને આપવામાં આવતા પૂરક આહારની માત્રા તથા ઘટ્ટતા ધીમે-ધીમે વધારતા રહો. યાદ રાખો બાળકને આપવામાં આવતો આહાર પાણી જેવો પાતળો ન હોવો જોઈએ.

– તમે અથવા તો તમારા કુટુંબીજનોએ બાળકને ભોજન અલગ વાસણમાં આપવું, જેનાથી તમને ખ્યાલ આવશે કે બાળકે કેટલો ખોરાક ખાધો છે.

– તમે બાળકને ઉપરી આહાર સાથે-સાથે બે વર્ષ સુધી સ્તનપાન કરાવતા રહો. જેથી આપના બાળકનો સંપર્ણ વિકાસ થશે તે આનંદિત, સંતુષ્ટ અને સ્વસ્થ રહેશે તેમજ તેનું વજન યોગ્ય રીતે વધશે.

– બાળકને ભૂખ લાગી હોય તેના લક્ષણોને ઓળખો અને તમે જાતે જમાડો.

33

ઉપરી આહાર કેટલો અને કેટલી વખત આપવો

પ્ર : તમે બાળકને દિવસમાં કેટલી વખત ખાવાનું આપો છો ? તેમજ શું શું ખવડાવો છો ?

– યાદ રાખો કે બાળકને ઘરમાં બનતો ખોરાક જ આપો. ૩-૪ વસ્તુઓના મિશ્રણથી સારો પૂરક આહાર બને છે જે ખોરાક ઘરમાં બને છે તે ખોરાકનું મિશ્રણ કરીને ઉપરી આહાર બનાવો.
  - ૬ - ૧૨ મહિના એક વખતે એક વાટકી* દિવસમાં ત્રણ વખત (જો કોઈ કારણોસર સ્તનપાન બંધ કરવામાં આવે તો એક વાટકી દિવસમાં પાંચ વાર)
  - ૧ થી દોઢ વર્ષ એક વખતે દોઢ વાટકી* દિવસમાં પાંચ વખત
  - ૨ વર્ષથી વધુ ઘરમાં બનતો ખોરાક દિવસમાં ત્રણ વખત ઉપરાંત વચ્ચે દિવસમાં બે વખત પોષક નાસ્તો જેમકે કેળા, ચીકુ, કેરી, પપૈયુ, ઈંડા વગેરે.

– દિવસ દરમ્યાન બાળકને ભોજન ઉપરાંત વચ્ચે વચ્ચે ખવડાવતા રહો. જેમ કે, મસળેલું કેળું / ચીકું / કેરી / પપૈયું. વધુ વિગત માટે મમતા કાર્ડમાં આપેલ ''બાળક માટે આહાર''ની વિગતો જૂઓ.

– સ્તનપાન કરાવવાનું ચાલુ રાખો.

– તમારા બાળકને ખોરાક ખાવા માટે પ્રોત્સાહિત કરાતા રહો જેથી બાળક ખુશીથી ખોરાક ખાય.

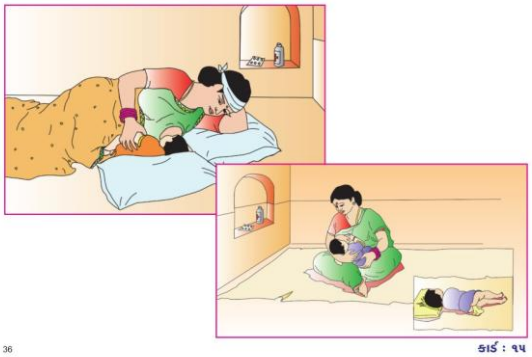
– એક વર્ષના બાળકને જાતે ખાવા દો.

– તેને વિવિધ પ્રકારનો ખોરાક આપતા રહો.

– બાળકને ખવડાવતાં પહેલાં તમારા અને બાળકના હાથ સાબુ તથા પાણી વડે જરુર ધોઈ નાખો.

*એક વાટકી = ૨૫૦ એમ.એલ.

જો માતા કે બાળક બીમાર હોય ત્યારે પણ માતાએ સ્તનપાન કરાવવાનું ચાલુ રાખવું જોઈએ.



36

કાર્ડ : ૧૫

જો માતા કે બાળક બીમાર હોય ત્યારે પણ માતાએ સ્તનપાન કરાવવાનું ચાલુ રાખવું જોઈએ.

પ્ર : આ ચિત્રમાં માતા શું કરી રહી છે ?

❖ ચિત્રમાં માતા બીમાર છે છતાં પણ તે બાળકને સ્તનપાન કરાવી રહી છે.

– જ્યારે તમે બીમાર હો ત્યારે પણ તમારા બાળકને ધવડાવવાનું ચાલુ રાખો.

પ્ર : આ ચિત્ર જોઈને આપને શું સમજાય છે ?

❖ આ ચિત્રમાં બાળક બીમાર છે તેને ઝાડા થયા છે અને માતા તેને ધવડાવી રહી છે.

– બાળક બીમાર હોય ત્યારે પણ તેને ધવડાવવાનું ચાલુ રાખો. આમ કરવું એટલા માટે જરૂરી છે કે માતાના ધાવણમાં જરૂરી એવા બધાજ પોષક તત્ત્વો છે જે બાળકને બીમારી સામે લડવામાં મદદ કરે છે અને બાળક ઝડપથી સાજુ થઈ જાય છે.

– જો બાળક ૬ મહિના કરતા મોટું છે તો બાળકને પોતાની પસંદનો ખોરાક ખાવા માટે પ્રોત્સાહિત કરો.

– બીમારી પછી સ્તનપાનની સાથે-સાથે વધુ વખત પૂરક આહાર આપો અને ખવડાવત વખતે બાળકને વધુ ને વધુ ખાવા માટે પ્રોત્સાહિત કરો.

– કોઈ ગંભીર બીમારી હોય તો ડૉક્ટરની સલાહ અચૂક લેવી.

37

મુખ્ય સંદેશ

- ગર્ભાવસ્થા દરમ્યાન માતાના આરામ એન ખાવા-પીવાની બાબતોનું પૂરતું ધ્યાન રાખવું જોઈએ તથા આવનારા શિશુના સ્તનપાન અને પાલન-પોષણની તૈયારી કરવી જોઈએ.
- દર મહિને બાળકનું વજન કરાવવાથી બાળકના વિકાસ અને વૃધ્ધિની યોગ્ય દેખરેખ રાખી શકાય છે.
- સ્તનપાન કરાવવાથી શિશુને, માતાને અને પરિવારને એમ બધાને એનક ફાયદાઓ થાય છે.
- બાળકને જન્મના પહેલા જ કલાકમાં સ્તનપાન શરૂ કરાવવું જોઈએ.
- નવજાત બાળકને ગોળ કે સાકરનું પાણી, ગળથૂંથી, જન્મઘૂટ્ટી કે મધ વગેરે આપવાથી નુકસાન થઈ શકે છે અને તે માતાનું ધાવણ પીવામાં ઓછુ ધ્યાન આપશે.
- જન્મના પહેલા ૬ મહિના શિશુને ફક્ત સ્તનપાન જ કરાવો. ઉપરનો આહાર કે પાણી પણ આપવું જોઈએ નહીં.
- બાળકને ધવડાવતી વખતે માતાના સ્તનની ડીંટડી અને તેની આસપાસના કાળા ભાગનો વધુમાં વધુ ભાગ બાળકના મોઢામાં રહે તે રીતે બાળકને વળગાડવું જોઈએ.
- કોઈ વિશેષ પરિસ્થિતિમાં શિશુ સ્તનપાન ન કરી શકે તો માતાએ પોતાના હાથ વડે સ્તનમાંથી દૂધ કાઢીને ધોયેલા સ્વચ્છ કપ / વાટકીમાં કે ચમચી વડે બાળકને પીવડાવી શકે છે.
- ૬ મહિના પછી સ્તનપાનની સાથે-સાથે શરૂઆતમાં થોડો પાતળો (પાણી જેવો નહી), પછી થોડા દિવસ બાદ ઘટ્ટ પૂરક આહાર આપવાનું પણ શરૂ કરી દો. ૬ થી ૧૨ મહિના સુધી દિવસમાં ત્રણવાર તથા એક વર્ષની ઉંમરથી દિવસમાં પાંચ વખત ખોરાક આપો.
- પૂરક આહારની માત્રા તથા ઘટ્ટતા ધીમે-ધીમે વધારો. તેની સાથે-સાથે બે વર્ષ કે તેથી વધુ સમય સુધી સ્તનપાન ચાલુ રાખો.
- જો માતા કે બાળક બીમાર હોય તો પણ સ્તનપાન કરાવવાનું ચાલુ રાખવું જોઈએ.

38

પહેલા ૬ મહિના સુધી ફક્ત સ્તનપાન,
૬ મહિના પછી સ્તનપાન અને
ઉપરી આહાર આપવાથી અને આ સમય
દરમ્યાન બાળક સાથે વાત-ચીત કરવાથી
અને રમવાથી બાળકનો
સંપૂર્ણ વિકાસ થાય છે.

39

ગીત

"બાળપોષણ અને માતાનું આરોગ્ય"

બહેનો તમે બાળકનાં પોષણને જાણજો..ગર્ભમાંથી બાળકને પોષણ અપાવજો,
"મમતાકાર્ડ" પોષણની "ગીતા" છે માનજો... હો.. રાજ... ગર્ભવતી માને સમજાજો... બહેનો તમે..

લોહતત્વ ગોળી દરમાસે મા ને આપજો... વજન નોંધી, રસી ધનુરની મુકાવજો.
ખોરાકમાં પૌષ્ટીકાહાર મા ને આપજો... હો.. રાજ... ફળ, શાકભાજી લીલાં આપજો... બહેનો તમે..

સુવાવડની તૈયારીમાં રુપિયા બચાવજો... બચત સાથે વાહનની સુવિધા રાખજો,
દવાખાને રક્ષીત સુવાવડ કરાવજો... હો... રાજ... સાવધાની પૂરેપૂરી રાખજો... બહેનો તમે..

જનમ થતાં પહેલું દૂધ પાવા સમજાવજો... યાદ રાખી અમૃત છે ચીક જરુર આપજો,
પહેલા ૬ માસ સુધી ફક્ત સ્તનપાન જ કરાવજો... હો... રાજ... શાંત ચિત્તે ધાવણ કરાવજો... બહેનો તમે..

રસીકરણ "મમતાકાર્ડ" વાચી કરાવજો... માપદંડ બાળકનાં સ્વાસ્થ્ય કેરો માનજો,
રસી બાળરક્ષક અચૂકથી મૂકાવજો... હો... રાજ... દોઢ વર્ષ અવશ્ય ધ્યાન આપજો... બહેનો તમે..

માસ છ પછી ખોરાક ધટ્ટ ખવડાવજો... દાળ, તેલ, ઘી, ગોળ મસળીને આપજો,
કેરી, ચીકુ, કેળાં, ફળ, શાકભાજી આપજો... હો... રાજ... હુષ્ટ-પુષ્ટ બાળક બનાવજો...બહેનો તમે..

બાળ બે જ બસનાં ગણિતને ગણાવજો... બેની વચ્ચે ગાળો હોવાનું ભણાવજો,
બુધ્ધિમાન બાળકને કુળને ઉજાળજો... હો... રાજ... નાગરિક ઉત્તમ બનાવજો... બહેનો તમે..

"દીકરા-દીકરી એક જ સમાન છે" સમજાવજો...ભેદ શાને? દીકરીનાં ઉછેરમાં સમજાવજો,
માને પોતે દીકરી હોવાનું ભાન લાવજો... હો... રાજ... જાગૃતિ જગમાં ફેલાવજો... બહેનો તમે..

બીના દેસાઇ

આ પુસ્તિકા બ્રેસ્ટફીડીંગ પ્રમોશન નેટવર્ક ઓફ ઈન્ડિયા દ્વારા હિન્દીમાં તૈયાર કરવામાં આવેલ પરામર્શ પુસ્તિકાના આધારે તૈયાર કરવામાં આવી છે.

Annexure 5: Capacity Building Received/Attended by AWWs

	Collective Capacity Building			On-the-job Capacity Building	
AWC No.	Three Days	Monthly Seja Meeting (7 meeting)	Reinforcement of Capacity Building (1-Day)	MAMTA DAY (at least once)	Regular Day (at least once)
1.	3	6	1	2	1
2.	3	6	-	1	-
3.	3	6	-	1	2
4.	3	7	-	2	2
5.	2	6	1	2	2
6.	3	7	1	1	-
7.	3	6	-	1	1
8.	2	4	-	2	1
9.	3	6	1	2	2
10	3	7	1	3	1
11	3	7	1	2	-
12	3	6	1	1	1
13	3	7	1	1	1
14	3	7	1	2	1
15	3	6	1	2	-
16	3	7	-	3	-
17	3	7	1	1	-
18	3	6	1	2	1
19	3	7	1	1	1

Note: Name of AWC removed to ensure confidentiality

Annexure 6: Messages Developed For Counseling on IYCF

મુખ્ય મુદદા – સ્તનપાનની વહેલી શરુઆત

છેલ્લા મહિના ધરાવતી તમામ સર્ગભા (૭,૮,૯) તથા તેના કટંબાન સભ્યોને સ્તનપાનની વહેલી શરુઆત વિષે નક્કી કરેલ ૧૦ મુદદા મુજબ સમજણ આપવી

(૧)બાળકને જન્મ સાથેજ તરતજ પ્રથમ કલાકમાં માતાની છાતી પર બજાડવુ.
(૨)જન્મ પછી તરતજ માતાની છાતી પર બાળકને બજાડવાથી બાળકને હુફ મળે છે; જેથી બાળક નુ ઠંડુ પડવાના કારણે સંભવ મુત્યુ નુ જોખમ અટકે છે.
(૩)જન્મ પછી તરતજ માતાની છાતી પર બાળકને બજાડવાથી માતાના શરીરમાંથી લોહી વહેતુ અટકે છે; જેથી માતાનુ વધારે લોહી વહી જાવાના કારણે સંભવ મુત્યુ નુ જોખમ અટકે છે.
(૪)જન્મ પછી તરતજ માતાની છાતી પર બાળકને બજાડવાથી માતા ને દુધ જલદી ઉતરે છે.
(૫)પહેલા બે દિવસ બાળક જયારે પણ રડે તેને માતાની છાતી પર બજાડવું.
(૬)પહેલા બે દિવસ છાતી માથી પીળુ ઘટ્ટ પ્રવાહી એટલેકે ચીક આવે છે.
(૭)ચીક એ બાળક માટેનુ પ્રથમ રસીકરણ છે.
(૮)બાળકને જન્મ વખતે કશુ પણ ચટાડવુ નહી જેમ કે ગોળ સાકર કે પતાસાનુ પાણી. આનાથી બાળકને જીવલેણ ચેપ લાગી શકે છે જેથી તેને ઝીણી શરદી અને પછી જીવલેણ ઝાડા થાય છે.
(૯)પહેલા છ માસ બાળકને પાણી કે અન્ય પ્રવાહી કે ખોરાક આપવો નહી આથી બાળકને જીવલેણ ચેપ લાગી શકે છે જેથી તને ઝીણી શરદી અને પછી જીવલેણ ઝાડા થાય છે.
(૧૦) ડોકટરની સલાહ વગર બાળકને જાતે કોઈ પણ પ્રકાર ની દવા જેમ કે બાબુલીન ગ્રાઈપ વોટર સોમવા ચોગ્રીસ કે ચમચો આપવો નહી. જાતે આપવામા આવેલ દવા શિશુના વિકાસ માં ખુબજ વિપરીત આસર કરી શકે છે.

મુખ્ય મુદદા – છ માસ સુધી ફક્ત સ્તનપાન – પાણી પણ નહી

નવા જન્મેલા તથા છ માસ થી નાના તમામ બાળકની માતા તથા કુટુંબના અન્ય વ્યકતી છ માસ સુધી ફક્ત સ્તનપાન અંગે સમજણ આપવી

૧. પહેલા બે દિવસ બાળક જયારે પણ રડે તેને માતાની છાતી પર બજાડવું. છાતી પર બાળકને બજાડવાથી માતા ને દુધ જલદી ઉતરે છે.
૨. પહેલા છ માસ બાળકને પાણી ક અન્ય પ્રવાહી કે ખોરાક આપવો નહી આથી બાળકને જીવલેણ ચેપ લાગી શકે છે જેથી તેને ઝીણી શરદી અને પછી જીવલેણ ઝાડા થાઈ શકે છે
૩. ધવડાતી વખતે એક બાજુની છાતી ખાલી થયા પછી જ બાળકને બીજી છાતી પર ધવડાવુ – માના શરૂઆતના ધાવણમાં પાતળું દૂધ આવે છે જેના થી બાળકની તરસ સંતોષાય છે. ત્યાર પછીનું ધાવણ ઘટ્ટ હોય છે. તેમા ચરબી અને પોષકતત્વો વધારે હોય છે; જે બાળકને શકિત આપે છે તથા વિકાસ માટે મદદ રૂપ થાય છે.
૪. દરેક વખતે બાળકેન ઓછામા ઓછુ ૨૫-૩૦ મિનીટ ધવડાવુ
૫. દિવસ એન રાતે મળીને બાળકને ઓછામા ઓછુ ૮–૧૦ વાર ધવડાવવુ
૬. બાળક માંદુ હોય ત્યારે પણ ધવડાવવાનુ ચાલુ રાખવુ બાળક માટે ખબજ જરૂરી છે.

૭. ડોકટરની સલાહ વગર બાળકને જાતે કોઈ પણ પ્રકાર ની દવા જેમ કે બાબુલીન, ગ્રાઈપ વોટર, સોમવા ચોગીસ, કે ચમચો આપવો નહી. જાતે આપવામા આવેલ દવા શિશુના વિકાસ માં ખુબજ વિપરીત આસર કરી શકે છે.

મુખ્ય મુદદા – છ માસ બાદ ઉપરી આહારના શરૂવાત

સાતમો મહિનો શરૂ થયેલ તથા બે વર્ષ થી નાના તમામ બાળકોની માતા તથા કુટુંબના અન્ય વ્યકતી ને સ્તનપાન સાથે ઉપરી આહારી તથા બાળભોગ ની શરૂઆત, તેના ફાયદા, ઘટતા અને માત્રા વિષે સમજ આપવી

૧. છ માસ પુરા થતા પછી સ્તનપાન સાથે શરૂ કરવામાં આવેલ ઢીલો અને ઘટ્ટ ઉપરી ખોરાક બાળકને વિકાસ અને વૃધ્ધી મા ખુબજ સારી મદદ કરે છે
૨. ચમચી માથી રેલાય નહી તેવો ઘટ્ટ ખોરાક બાળકને વધારે શક્તિ આપે છે.
૩. પ્રાણી જન્ય ખોરાક જેમ કે દુધ, દહી. માખણ, ચિઝ, ઈંડા, માછલી, માસ વગેરે બાળકના વિકાસ મા મદદ કરે છે.
૪. કઠોળ, દાણા અને સુકો મેવો પણ બાળકના વિકાસ મા મદદ કરે છે.
૫. વધ્ધી થતા બાળકને વધારે ને વધારે ખોરાકની જરૂર હોય છે.
૬. બાળકને આપવામાં આવતો બાળભોગ નવ વિટામીન યુકત ઘઉ, ચણા, સોયાબીન, તેલ અને ખાંડ નો પોષ્ટિક લોટ છે જેથી બાળક જડપથી તંદુરસ્ત બને છે અને વજન વધે છે.
૭. બાળભોગ ની અનેક વાનગી જેમ કે શીરો, મુઠીયા, રોટલી, ભાખરી, સુખડી, હાંડવો, ઢોકળા, ઢેબરા વગેરે બની શકે છે.
૮. નાના બાળકને જાતે જમતા શીખવુ પડે છે, તેથી ખુબજ ધીરજ સાથે તેને પ્રોત્સાહન આપી મદદ કરવી.
૯. બાળકને બિમારી વખતે તથા બિમારી પછી સ્તનપાન સાથે વધારે ખોરાક અને દ્રવ્ય–પીણા લેવા માટે પ્રોત્સાહિત કરવા થી બાળક જલદીથી તંદુરસ્ત બને છે.
   બિમારી વખતે
   ૯.૧. બાળકને ખુબજ ધીરજ સાથે ખોરાક અને પીણા લેવા પ્રત્સાહિત કરવુ
   ૯.૨. બાળકને ઓછી માત્રા મા વધારે વખત ખોરાક આપવો
   ૯.૩. બાળકને મન ગમતો ખોરાક આપવો
   ૯.૪. બાળકને અલગ અલગ પ્રકારનો પોષ્ટિક ખોરાક આપવો
   ૯.૫. સ્તનપાન ચાલુ રાખવુ
૧૦. બિમારી પછી
   ૧૦.૧. બાળકને **વધારે** વખત ખોરાક આપવો
   ૧૦.૨. બાળકને **વધારે** ખોરાક આપવો
   ૧૦.૩. બાળકને **વધારે** પોષ્ટિક ખોરાક આપવો
   ૧૦.૪. બાળકને **વધારે** ધીરજ પુર્વક અને પ્રેમ સાથે ખોરાક આપવો
   ૧૦.૫. બાળકને **વધારે** સ્તનપાન આપવુ
૧૧. છ માસ પછી ખોરાક સાથે બે વર્ષ કે તેથી વધુ સ્તનપાન કરાવાથી બાળકનો વિકાસ અને વૃધ્ધી ખુબજ સારી થાય છે અને બાળકન તંદુરસ્ત રહે છે

Annexure 7: *MAMTA DAY* and home visits counseling Guideline on GMP and IYCF

મુખ્ય મુદ્દા – મમતા દિવસ

(૧) બે વર્ષ થી નાના તમામ બાળકોનુ મમતા દિવસે જ વજન કરવુ.
(૨) મમતા કાર્ડ માં પ્લોટીંગ કરી સાથે આવેલ વાલી અથવા વ્યકતી ને તેનું બાળક તંદુરસ્ત (લીલા પટ્ટા માં) છ કે કેમ તેની સમજ આપવી.
(૩) ત્યાર બાદ સાથે આવેલ વાલી અથવા વ્યકતી ને મમતા કાર્ડ મુજબ સ્તનપાન અને બાળ આહાર વિષે સમજણ આપવી.

➢ **યાદ રાખો :** ઉપરી આહાર બાળકને કેટલી **ઘટતા,માત્રા અને કેટલી વાર આપવાનો છે** તેના વિશે ખાસ સમજણ આપવી.

(૪) વજન, પ્લોટીંગ અને મમતા કાર્ડ મુજબ સમજ આપ્યા પછી જ બાળભોગ આપવો તથા બાળભોગ બનાવવાની પધ્ધતી અને વાનગીઓ વિશે ખાસ સમજણ આપવી.

➢ **યાદ રાખો :** માતા અને તેના કુટંબને ખાસ સમજ આપવી કે

❖ બાળભોગ નવ વિટામીન યુકત ઘઉ, ચણા, સોયાબીન, તેલ અને ખાંડ નો પોષ્ટિક લોટ છે જેથી બાળક જડપથી તંદુરસ્ત બને છે અને વજન વધે છે.
❖ બાળભોગ ની અનેક વાનગી જેમ કે શીરો, મુઠીયા, રોટલી, ભાખરી, સુખડી, હાંડવો, ઢોકળા, ઢેબરા વગેરે બની શકે છે.

(૫) સાતમો મહિનો શરૂ થયેલ તમામ બાળકોની માતા ને સ્તનપાન સાથે ઉપરી આહારી ની શરૂઆત, તેના ફાયદા, ઘટતા અને માત્રા વિષે ખાસ સમજ આપવી તથા બાળભોગ આપવો.
(૬) છેલ્લા મહિના ધરાવતી સર્ગભા (૭,૮,૯) માતાને સ્તનપાનની વહેલી શરુઆત વિષે નક્કી કરેલ ૧૦ મુદ્દા મુજબ સમજણ આપવી.
(૭) માંદા બાળકોની આઈ.એમ.એન.સી.આઈ. મુજબ ફોર્મ ભરી તપાસ કરવી.

મુખ્ય મુદ્દા – ગૃહમુલાકાત

(૧) દર રોજ કુલ પાંચ કુટુંબની મલાકાત કરવી
   ૧) સર્ગભા
   ૨) ધાત્રી
   ૩) ગ્રેડ ૧ (૨ વર્ષ થી નાના બાળકોને પહેલા આવરી લેવા)
   ૪) ગ્રેડ ૨ (૨ વર્ષ થી નાના બાળકોને પહેલા આવરી લેવા)
   ૫) ગ્રેડ ૩ અને ૪
(૨) ગૃહમુલાકાત વખતે નિચે જણવેલ વસ્તુ લઈ જવી
   ૧) ૦ થી બે માસના બાળકો ની ચકાસણી માટે આઈ.એમ.એન.સી.આઈ. રજીસ્ટર
   ૨) બે માસ થી પાંચ વર્ષ ના બાળકો ની ચકાસણી માટે આઈ.એમ.એન.સી.આઈ. રજીસ્ટર
   ૩) આઈ.એમ.એન.સી.આઈ. ની દવા ....નાની આર્યન, કોટ્રી.., જી વી પેન્ટ, પેરાસીટામોલ વગેરે...
   ૪) મમતા કાર્ડ
   ૫) બાળભોગ

૬) આઈ.એમ.એન.સી.આઈ. ની અન્ય સામગ્રી (થર્મોમીટર, નાના બાળકનો વજન કાંટો, ઘડીયાળ, આઈ.એમ.એન.સી.આઈ. ચોપડી વગેરે)

૭) ફ્લિપ ચાર્ટ

યાદ રાખો

સર્ગભાની ગૃહમુલાકાત વખતે ખાસ

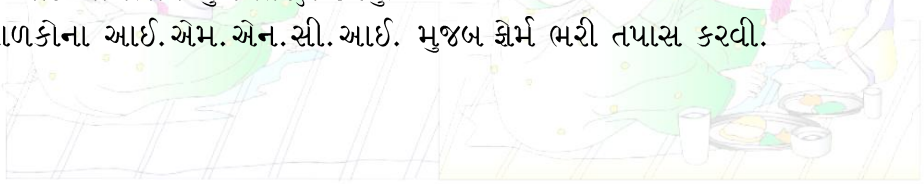
છેલ્લા મહિના ધરાવતી સર્ગભા (૭,૮,૯) તથા તેના કુટંબ ના સભ્યોને સ્તનપાનની વહેલી શરુઆત વિશે નક્કી કરેલ ૧૦ મુદદા મુજબ સમજણ આપવી

ધાત્રી તથા નવા જન્મેલ બાળકોની ગૃહમુલાકાત વખતે ખાસ

- નવા જન્મેલા તમામ બાળકોની પહેલા દસ દિવસ માં આઈ.એમ.એન.સી.આઈ. મુજબ ૧,૩ અને ૭ માં દિવસે મુલાકાત કરવી, ફીમ ભરવુ, સલાહ આપવી, જરુર જણાય ત્યા દવા આપવી તથા રેફરલ કરવુ. ફોર્મ ભરતી વખતે હંમેશા આઈ.એમ.એન.સી.આઈ. ની ચોપડી સાથે રાખવી.
- નવા જન્મેલા તમામ બાળકની માતાનુ બાળક વળગાડવા અને લેવાની રીતનુ ખાસ ૪ મિનીટ નિરીક્ષણ કરી જરૂર જણાય ત્યા સમજ અને શીખ આપવી.
- નવા જન્મેલા તમામ બાળકની માતા તથા કુટુંબના અન્ય વ્યકતી સ્તનપાન અંગે નક્કી કરેલ ૭ મુદદા મુજબ સમજણ આપવી.
- માંદા બાળકોના આઈ.એમ.એન.સી.આઈ. મુજબ ફોર્મ ભરી તપાસ કરવી

ગ્રેડ ૧, ૨, ૩ અને ૪ ની ગૃહમુલાકાત વખત ખાસ

- મમતા કાર્ડ ચેક કરવું.
- મમતા કાર્ડમા ન હોય ત્યા પ્લોટીંગ કરવુ.
- કાર્ડ મુજબ સ્તનપાન અને બાળ આહાર વિષે સમજણ આપવી.
- માતાને બે વર્ષ સુધી સ્તનપાન ચાલુ રાખવાની ખાસ સલાહ આપવી
- છઠો મહિનો ચાલતો હોય તેવા બાળકોની માતાને સાતમા મહિના થી સ્તનપાન સાથે ઉપરી આહારી ની શરુઆત તેના ફાયદા વિષે ખાસ સમજ આપવી.
- સાતમો મહિનો શરુ થયેલ તમામ બાળકોની માતા ને સ્તનપાન સાથે ઉપરી આહારી ની શરુઆત તેના ફાયદા, ઘટતા અને માત્રા વિષે ખાસ સમજ આપવી.
- સમજણ બાદ બાલભોગ નુ વિતરણ કરવુ.
- માંદા બાળકોના આઈ.એમ.એન.સી.આઈ. મુજબ ફોર્મ ભરી તપાસ કરવી.



Annexure 8: Post Capacity Building Visits at AWCs by Researcher

AWC	Routine Day	*MAMTA DAY*
Intervention Group		
1.	1	1
2.	1	1
3.	1	1
4.	1	1
5.	1	1
6.	1	1
7.	1	1
8.	Routine visit not done since AWW resigned	1
9.	3 (AWW gone for monthly meeting during 1st visit; AWW on leave during 2nd visit)	1
10.	2 (AWW gone to bank for Sakhi Mandal during 1st visit)	1
11.	2 (AWW gone with case during 1st visit)	1
12.	1	2 (MD conducted 2 days before schedule during 1st visit)
13.	1	1
14.	2 (AWW on sick leave during 1st visit)	1
15.	2 (AWW on sick leave during 1st visit))	-
16.	1	1
17.	1	1
18.	1	1
19.	1	1
Total	**24**	**19**
AWW absent/ *MAMTA DAY* not conducted	**5**	**1**
Control Group		
1.	1	-
2.	1	1
3.	1	1
4.	2	1
5.	2	1
6.	1	1
7.	1	1
8.	1	1
9.	1	1
10.	1	1
11.	1	1
12.	1	1
13.	1	1
14.	1	1
15.	1	1
16.	1	1
17.	1	1
Total	**19**	**16**

Note: Name of AWC removed to ensure confidentiality

Annexure 9: Checklist for Routine Day Observations Post Capacity Building

ફિલ્ડ વીઝીટ ચેક લીસ્ટ

હેતુ: કુપોષણ અટકાવવા હેતુ આંગણવાડી કાર્યકરની વૃદધી આલેખન અને સંપરામર્શ ની ગુણવત્તા વધારવા માટે શીશુ અને બાળક ની આહાર પુર્તી સંદભ થયેલ કાર્યશિબીર ની ફોલોઅપ વીઝીટ

૧. **મુલાકાતની વિગત :**

૧.૧. આંગણવાડી નું નામ: _____

૧.૨. તારીખ: _____

૧.૩. મુલાકાત નો પ્રકાર:

૧.૩.૧. મમતા દિવાસ

૧.૩.૨. રુટીન મુલાકાત

૧.૪. મુલાકાત નો સમય _____થી _____

૧.૫. મુલાકાત વખતે મળેલ વ્યક્તિ: _____

મમતા દિવસ

સેશન પ્લાન

શુ તમારી પાસે મમતા દિવસનું વિલેજ માઈક્રોપ્લાન છે? **હા- ના**

૧.૬. ***આંગણવાડી કાર્યકરને પુછવું.***ગયા મમતા દિવસ પર તમે શુ શુ પ્રવૃતિ કરી?

- બે વર્ષ સુધિના તમામ બાળકોનુ વજન
- મમતા કાર્ડ મા પ્લોટીંગ
- મમતા કાર્ડ મુજબ માર્ગદર્શન
- સમજણ સાથે બાળ ભોગ નુ વિતરણ
- છેલ્લા મહિના ધરાવતી તમામ સર્ગભાને સ્તનપાનની વહેલી શરૂઆત વિશે સમજણ
- IMNCI મુજબ બાળકની તપાસ કરી ફોર્મ ભરવા
- છ માસ પુરા થતા બાળકોની માતાને બાળ ભોગનુ વિતરણ
- રજીસ્ટરમાં નોંધણી
- community mobilization

૨. **વૃદધી આલેખન અને શીશુ અને બાળ આહાર ની પુર્તિ**

૨.૧. તમારા વિસ્તારમાં બે વર્ષ સુધિના રજીસ્ટર બાળકો કેટલા છે: _____

૨.૨. **આ પૈકી** કેટલા બાળકો છેલ્લા મમતા દિવસ પર હાજર રહેલ: _____

૨.૩. **આ પૈકી** કેટલા બાળકો નું મમતા દિવસે વજન કર્યું: _____

૨.૪. **આ પૈકી** કેટલા બાળકો નું મમતા દિવસે મમતા કાર્ડમા પ્લોટીંગ કર્યું: _____

૨.૫. **આ પૈકી** કેટલા બાળકો ના વાલી અથવા સાથે આવલે વ્યક્તી ને મમતા કાર્ડ મુજબ ખોરાક અને સ્તનપાન સંબંધી માર્ગ દર્શન આપ્યુ _____

૩. **બાળ ભોગ નુ વિતરણ**

૩.૧. શુ તમે **ગયા મમતા દિવસે** બાળ ભોગ નુ વિતરણ કર્યું હતુ? હા- ના

૩.૨. મમતા દિવસે બાળ ભોગ નુ વિતરણ ક્યારે કરવામાં આવ્યુ?

૩.૨.૧. વૃદધી આલેખન પ્લોટીંગ મમતા કાર્ડ મજબ માર્ગદર્શન પછી

૩.૨.૨. અન્ય _____

૩.૩. તમારા વિસ્તારમા કેટલા બાળકો એ ચાલુ માસમાં છ મહિના પુરા કરેલ છે? _____

૩.૪. **આ પૈકી** કેટલા બાળકોના વાલી અથવા સાથે આવલે વ્યકતી ને ઉપરી આહાર ની શરુઆત વિશે સમજણ આપી?

૩.૪.૧. મમતા દિવસે: _____

૩.૪.૨. ગૃહ મુલાકાત દરમ્યાન: _____

૩.૫. **આ પૈકી** કેટલા બાળકોને તમે બાળ ભોગ આપ્યો

૩.૫.૧. મમતા દિવસે: _____

૩.૫.૨. ગૃહ મુલાકાત દરમ્યાન: _____

૪. **સ્તનપાનની વહેલી શરૂઆત વિશે છેલ્લા મહિનાવાળી સર્ગભા સાથે સંપરામર્શ**

૪.૧. તમારા વિસ્તારમાં **છેલ્લા મહિના** એટલે કે ૭-૮-૯ મહિના ધરાવતી કેટલા **સર્ગભા** છે:

_____ ***નોંધ :- ગામની દિકરી અને વહુ ને ગણવી***

૪.૨. કુલ ગામમા હાજર. ૭-૮-૯ મહિના ધરાવતી સર્ગભા: _____

૪.૩. આ પૈકી કેટલી સર્ગભા ગયા મમતા દિવસ પર હાજર રહેલ છે; _____

૪.૪. આ પૈકી કેટલી સર્ગભા ની છેલ્લા એક મહિના દરમ્યાન ગુહમુલાકાત કરી; _____

૪.૫. આ પૈકી કેટલી સર્ગભાને સ્તનપાનની વહેલી શરૂઆત માટે માહિતી અને માર્ગદર્શન આપ્યુ: _____

૪.૫.૧. મમતા દિવસે: _____

૪.૫.૨. ગુહ મુલાકાત દરમ્યાન: _____

૪.૬. કેટલી છેલ્લા મહિના એટલે કે ૭-૮-૯ મહિના ધરાવતી સર્ગભાના કુટુબીજનોને સ્તનપાનની વહેલી શરૂઆત માટે માહિતી અને માર્ગદર્શન આપ્યુ

૪.૬.૧. મમતા દિવસે: _____

૪.૬.૨. ગુહ મુલાકાત દરમ્યાન: _____

૪.૭. શુ માર્ગદર્શન આપ્યુ

૪.૭.૧. સ્તનપાનની વહેલી શરૂઆત

૪.૭.૨. વહેલી શરૂઆતથી માતા અને બાળકના મૃત્યુનુ જોખમ ઘટે છે અને બાળકને હુફ મડે છે.

૪.૭.૩. પહેલા બે દિવસ બાળક જ્યાર પણ રડે ત્યારે છાતી પર બઝાડવુ

૪.૭.૪. પહેલા બે દિવસ છાતી માથી ધાવણ ન આવે પણ પીળુ ઘટ્ટ પ્રવાહી એટલેકે ચીક આવે છે.

૪.૭.૫. ચીક એ બાળક માટેનુ પ્રથમ રસીકરણ છે.

૪.૭.૬. બાળકને જન્મ વખતે કશુ પણ ચટાડવુ નહી

૪.૭.૭. પહેલા છ માસ બાળકને પાણી કે અન્ય પ્રવાહી કે ખોરાક આપવો નહી

૪.૭.૮. ડોકટરની સલાહ વગર બાળકને જાતે કોઈ પણ પ્રકાર ની દવા જેમ કે બાબુલીન ગ્રાઈપ વોટર સોમવા ચોગીસ કે ચમચો આપવો નહી

૪.૭.૯. કાર્યકર આપેલ મુદદા મુજબ માહિતી વાંચીને સમજાવે છે

૫. ફ્લીપ ચાર્ટનો ઉપયોગ

૫.૧. તમને આપેલ ફ્લીપ ચાર્ટ તમે ક્યારે કયારે વાપરયો છે

૫.૧.૧. મમતા દિવસે

૫.૧.૨. ગુહ મુલાકાત દરમ્યાન

૫.૧.૩. મમતા દિવસ સિવાય કેન્દ્ર પર

૫.૨. ફ્લીપ ચાર્ટ કોના માટે વાપરયો છે

૫.૨.૧. સર્ગભા

૫.૨.૨. ધાત્રી

૫.૨.૩. છ થી એક માસ ના બાળકો

૫.૨.૪. એક વર્ષ થી મોટા બાળકો

૬. નવા જન્મેલા બાળકો ની વિગત – છેલ્લા એક મહિના દરમ્યાન

૬.૧.	બાળક નુ નામ		
૬.૨.	જન્મ તારીખ		
૬.૩.	ઉમર – દિવસ માં		
૬.૪.	જન્મનું સ્થળ	ઘર – સંસ્થા	ઘર – સંસ્થા
૬.૫.	શુ બાળક ૨.૫ કે તેથી ઓછુ વજન ધરાવે છે	હા - ના	હા - ના
૬.૬.	જો સંસ્થાકીય સુવાવડ હોય તો ઘરે આવવાની તારીખ		
૬.૭.	કરેલ ગુહ મુલાકાત ના દિવસ		
૬.૮.	IMNCI ના કુલ ભરેલા ફોર્મ		
૬.૯.	સ્તનપાન ની શરુઆતનો સમય		
૬.૧૦.	ગુહ મુલાકાત દરમ્યા ***સ્તનપાન અંગે શુ શુ ચકાસણી કરી અને સલાહ આપી***		
૬.૧૦.૧.	છ માસ સુધી ફક્ત સ્તનપાન		
૬.૧૦.૨.	બાળકને લેવા અને વળગાડવાની રીતની ચકાસણી		
૬.૧૦.૩.	બાળકને લેવા અને વળગાડવાની રીતની સમજણ		
૬.૧૦.૪.	ડોકટરની સલાહ વગર બાળકને જાતે કોઈ પણ દવા આપવી નહી		
૬.૧૦.૫.	બાળકને કેટલી વાર સ્તનપાન કરાવવું		
૬.૧૦.૬.	બાળકને કેટલી વખત સ્તનપાન કરાવવું		

૬.૧૧. શુ માતાને ધવડાવવા અંગે કોઈ તકલીફ કે મુંઝવણ આવેલ છે		
૬.૧૨. બાળકને માતાના દધ સિવાય અન્ય પ્રવાહી આપવામાં આવેલ છે		

૭. **ગૃહ મુલાકાત**

૭.૧. ગઈ કાલે તમે કોઈ ગૃહમુલાકાત કરેલ છે? હા—ના

નોંધ – હોમ વિઝીટ રજીસ્ટર માથી ચકાસવુ

જોના તો કારણ નોંધો_____

૭.૨. છેલ્લા છ ચાલુ દિવસ મા તમે કેટલા દિવસ ગૃહમુલાકાત કરી: _____

નોંધ – હોમ વિઝીટ રજીસ્ટર માથી ચકાસવુ

૭.૩. છેલ્લા છ ચાલુ દિવસ મા તમે કેટલા ઘરની ગૃહમુલાકાત કરી: _____

નોંધ – હોમ વિઝીટ રજીસ્ટર માથી ચકાસવુ

૭.૪.ગૃહમુલાકાત માટે તમે ઘર કઈ રીતે નક્કી કરો છો?

૭.૪.૧. નક્કી કરેલ માર્ગ દર્શીકા મુજબ

૭.૪.૨. અન્ય: _____

૭.૫. ગૃહમુલાકાત માટે તમે કઈ કઈ વસ્તુ લઈને જાવ છે?

૭.૫.૧. ૦ થી બે માસના બાળકો ની ચકાસણી માટે IMNCI રજીસ્ટર

૭.૫.૨. બે માસ થી પાંચ વષ ના બાળકો ની ચકાસણી માટે IMNCI રજીસ્ટર

૭.૫.૩. IMNCI ની દવા

૭.૫.૪. મમતા કાર્ડ

૭.૫.૫. બાળભોગ

૭.૫.૬. IMNCI ની અન્ય સામગ્રી (thermometer, wt scale, watch, IMNCI booklet etc)

૭.૫.૭. ફ્લિપ ચાર્ટ

૭.૬. ગૃહમુલાકાત મા તમે શુ કર્યુ

૭.૬.૧. મમતા કાર્ડ ચેક કર્યુ

૭.૬.૨. મમતા કાર્ડમા ન હોય ત્યા પ્લોટીંગ

૭.૬.૩. કાર્ડ મુજબ સમજણ

૭.૬.૪. નવા જન્મેલ બાળકોના IMNCI ફોર્મ ભર્યા

૭.૬.૫. માંદા બાળકોના IMNCI ફોર્મ ભર્યા

૭.૬.૬. સમજણ બાદ બાલભોગ નુ વિતરણ

૭.૬.૭. છેલ્લા મહિના વાડી સર્ગભાને સ્તનપાનની વહેલી શરૂઆત માટે સલાહ આપી

૭.૬.૮. છેલ્લા મહિના વાડી સર્ગભાને કુટુબી ને સ્તનપાનની વહેલી શરૂઆત માટે સલાહ અને માર્ગદર્શન આપયુ

********************આભાર********************

Annexure 10: *MAMTA DAY* - Field Visit Checklist

મમતા દિવાસ – ફીલ્ડ વીઝીટ ચેક લીસ્ટ

હેતુ: કુપોષણ અટકાવવા હેતુ આંગણવાડી કાર્યકરની વૃદધી આલેખન અને સંપરામર્શ ની ગુણવત્તા વધારવા માટે શીશુ અને બાળક ની આહાર પુર્તી સંદભ થયેલ કાર્યશિબીર ની ફોલોઅપ વીઝીટ

૧. **મુલાકાતની વિગત :**

૧.૧. આંગણવાડી નું નામ: _____

૧.૨. તારીખ: _____

૧.૩. મુલાકાત નો સમય _____થી _____

૧.૪. મુલાકાત વખતે મળેલ વ્યક્તિ: _____

મમતા દિવસ

સેશન પ્લાન

૧.૫. શુ તમારી પાસે મમતા દિવસનું વિલેજ માઈક્રોપ્લાન છે? હા– ના

૧.૬. **શુ આયોજન પ્રમાણ મમતા દિવસ ની પ્રવતિ થઈ રહી છે?** હા– ના

૧.૭. ***જુવો અને*** નોંધણી ***કરો કે કઈ કઈ*** પ્રવૃતિ કરવામાં આવી રહી છે?

- બાળકોનુ વજન
- મમતા કાર્ડ મા પ્લોટાંગ
- મમતા કાર્ડ મુજબ માર્ગદર્શન
- બાળ ભોગ નુ વિતરણ
- સમજણ સાથે બાળ ભોગ નુ વિતરણ
- છેલ્લા મહિના ઘરાવતી તમામ સર્ગભાને સ્તનપાનની વહેલી શરૂઆત વિશે સમજણ
- IMNCI મુજબ માંદા કે નવા જન્મે લા બાળકની તપાસ કરી ફોર્મ ભરવા

૨. **વૃદધી આલેખન અને શીશુ અને બાળ આહાર ની પુર્તિ**

૨.૧. વિસ્તારમાં બે વર્ષ સધિના રજીસ્ટર બાળકો કેટલા છે: _____

૨.૨. આ પૈકી કેટલા બાળકો આજે મમતા દિવસ પર હાજર છે: _____/_____સમય

૨.૩. આ પૈકી કેટલા બાળકો નું આજે મમતા દિવસ પર વજન કર્યું: _____

૨.૪. આ પૈકી કેટલા બાળકો નું આજે મમતા દિવસ પર કાર્ડમા પ્લોટીંગ કર્યું: _____

૨.૫. આ પૈકી કેટલા બાળકો ના વાલી અથવા સાથે આવલે વ્યકતી ને મમતા કાર્ડ મુજબ ખોરાક અને સ્તનપાન સંબંધી માર્ગ દર્શન આપ્યુ _____

મમતા દિવસ પર આવતા બે વર્ષ સુધિના બાળકો નુ નિરીક્ષણ

બાળક ની ઉમર	
મમતા દિવસ પર તમે શુ શુ કરીયુ?	
આજે મમતા દિવસે વજન કરવા માં આવેલ	હા / ના
મમતા કાર્ડ માં પ્લોટીગ કરવા માં આવેલ	હા / ના
મમતા કાર્ડ મુજબ માર્ગ દર્શન આપ્યુ	હા / ના
બાળ ભોગ આપવામા આવેલ	હા / ના
રસિકરણ કરવામાં આવેલ	હા/ ના/*જરૂર નથી*
સ્તનપાનનુ મૂલ્યાંકન કરવામાં આવેલ	હા/*જરૂરી પણ કરવામાં આવેલ નથી* /*જરૂર નથી*
IMNCI મુજબ બાળકની તપાસ કરી ફોર્મ ભરવામાં આવેલ છે	હા/ના/*જરૂર નથી*

સ્તનપાનની વહેલી શરુઆત વિશે છેલ્લા મહિનાવાળી સર્ગભા સાથે સંપરામર્શ

સર્ગભા ના પૂરા થયેલ મહિના	
આજે મમતા દિવસે વજન કરવા માં આવેલ	હા / ના
આજે રસીકરન કે તપાસ કરવામાં આવેલ	હા / ના
સ્તનપાનની વહેલી શરુઆત વિશે સમજણ આપવામાં આવેલ	હા / ના
સર્ગભાના કુટુબીજનોને સ્તનપાનની વહેલી શરુઆત માટે સમજણ આપવામાં આવેલ	હા / ના
ફ્લીપ ચાર્ટનો ઉપયોગ કરી સમજાવામાં આવેલ	હા / ના
સ્તનપાનની વહેલી શરુઆત ના તમામ મુદદા આવરી લેવામાં આવેલ	હા / ના

Annexure 11 : IYCF Core Indicators

1. **Early initiation of breastfeeding:** Proportion of children born in the last 24 months who were put to the breast within one hour of birth.

$$\frac{\text{Children born in the last 24 months who were put to the breast within one hour of birth}}{\text{Children born in the last 24 months}}$$

2. **Exclusive breastfeeding under 6 months:** Proportion of infants 0–5 months of age who are fed exclusively with breast milk.

$$\frac{\text{Infants 0–5 months of age who received only breast milk during the previous day}}{\text{Infants 0–5 months of age}}$$

3. **Continued breastfeeding at 1 year:** Proportion of children 12–15 months of age who are fed breast milk.

$$\frac{\text{Children 12–15 months of age who received breast milk during the previous day}}{\text{Children 12–15 months of age}}$$

4. **Introduction of solid, semi-solid or soft foods:** Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.

$$\frac{\text{Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day}}{\text{Infants 6–8 months of age}}$$

5. **Minimum dietary diversity:** Proportion of children 6–23 months of age who receive foods from 4 or more food groups.

$$\frac{\text{Children 6–23 months of age who received foods from } \geq 4 \text{ food groups during the previous day}}{\text{Children 6–23 months of age}}$$

6. **Minimum meal frequency:** Proportion of breastfed and non-breastfed children 6–23 months of age, who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more.

The indicator is calculated from the following two fractions:

$$\frac{\text{Breastfed children 6–23 months of age who received solid, semi-solid or soft foods the minimum number of times or more during the previous day}}{\text{Breastfed children 6–23 months of age}}$$

And

$$\frac{\text{Non-breastfed children 6–23 months of age who received solid, semi-solid or soft foods or milk feeds the minimum number of times or more during the previous day}}{\text{Non-breastfed children 6–23 months of age}}$$

7. **Minimum acceptable diet:** Proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk).

This composite indicator will be calculated from the following two fractions:

$$\frac{\text{Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day}}{\text{Breastfed children 6–23 months of age}}$$

And

$$\frac{\text{Non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day}}{}$$

Non-breastfed children 6–23 months of age

8. **Consumption of iron-rich or iron-fortified foods:** Proportion of children 6–23 months of age who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

Children 6–23 months of age who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was fortified in the home with a product that included iron during the previous day

Children 6–23 months of age

Optional Indicators

9. **Children ever breastfed:** Proportion of children born in the last 24 months who were ever breastfed.

Children born in the last 24 months who were ever breastfed

Children born in the last 24 months

10. **Continued breastfeeding at 2 years:** Proportion of children 20–23 months of age who are fed breast milk.

Children 20–23 months of age who received breast milk during the previous day

Children 20–23 months of age

11. **Age-appropriate breastfeeding:** Proportion of children 0–23 months of age who are appropriately breastfed.

The indicator is calculated from the following two fractions:

Infants 0–5 months of age who received only breast milk during the previous day

Infants 0–5 months of age

And

Children 6-23 mo. of age who received breast milk, as well as solid, semi-solid or soft foods, during the previous day.

Children 6–23 months of age

12. **Predominant breastfeeding under 6 months:** Proportion of infants 0–5 months of age who are predominantly breastfed.

Infants 0–5 months of age who received breast milk as the predominant source of nourishment during the previous day

Infants 0–5 months of age

13. **Duration of breastfeeding:** Median duration of breastfeeding among children less than 36 months of age.

The age in months when 50% of children 0–35 months did not receive breast milk during the previous day

14. **Bottle feeding:** Proportion of children 0–23 months of age who are fed with a bottle.

Children 0–23 months of age who were fed with a bottle during the previous day

Children 0–23 months of age

15. **Milk feeding frequency for non-breastfed children:** Proportion of non-breastfed children 6–23 months of age who receive at least 2 milk feedings.

Non-breastfed children 6–23 months of age who received at least 2 milk feedings during the previous day

Non-breastfed children 6–23 months of age

Annexure 12: Relationship between Various Independent Variables and Mean Z Score

The following independent variables were assessed with the respective Z-scores (i..e WHZ, WAZ, MUACZ and HAZ). Only those found significantly associated are displayed in the following tables

Independent Variables assessed	
Caste	
Age Group	LBW
Sex	EIBF
Baseline (IG vs. CG)	EBF
Impact (IG vs. CG)	CF at 6 months (6-23 mo.)
IG (pre vs post)	GMP (the previous month)
CG (pre vs post)	Diarrhea
Mother's age group	Cough
Mother's Educational Score	Fever
Mother's Occupational Score	Last *MAMTA DAY* attended
Wealth Index Kuppuswamy's Socioeconomic Status Scale, 2007	*Balbhog* consumed in 24 hours preceding the survey
Storage of Drinking Water (Container Covered And Kept On High Platform	Children Having Access and Using Household Toilet
Safety of drawing drinking water from the container	Hand-washing with Soap and water after Child feeding

Relationship Various Independent Variables and Mean WAZ Score

	WAZ					
	N	**Mean**	**SE**	**'F' Value**	**'T' Value**	
Wealth Index Kuppuswamy's Socioeconomic Status Scale, 2007						
• Lower Middle + Upper middle (3)[#]	14	-1.439	0.348	8.512***	-2.570*	3 vs. 5
• Upper lower (4)	411	-1.839	0.055		3.813***	4 vs. 5
• Lower (5)	108	-2.307	0.113		3.460***	3 vs. 5
Caste						
• General (1)	63	-1.213	0.124	16.829***	4.152***	4 vs. 1
• SC (2)	25	-1.345	0.250		-3.779***	3 vs. 4
• ST (3)	214	-2.248	0.078		-3.704***	2 vs. 3
• OBC (4)	267	-1.855	0.069			
Children Having Access and Using Household Toilet						
• No	454	-1.975	0.055	3.502*	-2.599**	
• Yes	110	-1.654	0.107			
Mother's Educational Score						
• Illiterate (1)	153	-2.219	0.096	6.564***	-2.833**	1 vs.2
• Primary school (2)	258	-1.881	0.072			
• Middle school (3)	134	-1.670	0.096		2.684**	4 vs. 1
• High school + (4)[$]	24	-1.522	0.227			

	WAZ					
	N	**Mean**	**SE**	**'F' Value**	**'T' Value**	
Mother's Occupational Score						
• Unemployed (1)	524	-1.890	0.051	2.411*		
• Unskilled worker (2)	4	-2.963	0.761			
• Semi-skilled worker (3)	15	-2.607	0.373			
• Skilled worker (4)	3	-1.360	0.648			
• Clerical, Shop-owner, Farmer (5)	11	-1.742	0.310			
Sex						
• Female	429	-1.866	0.060	5.322*	-2.307*	1 vs. 2
• Male	508	-2.045	0.051			
Child's Age Group						
• 0 to 5 (5)	246	-1.591	0.075	26.718***	7.069***	5 vs. 12
• 12 to 23 (12)	442	-2.239	0.054		2.369*	5 vs. 6
• 6 to 11 (6)	249	-1.841	0.074		-4.379***	6 vs. 12
LBW						
• Normal	337	-1.640	0.062	33.065***	-5.750***	
• LBW	111	-2.346	0.104			
Diarrhea						
• No	486	-1.859	0.053	8.474**	2.911**	
• Yes	82	-2.264	0.131			
Last *MAMTA DAY* attended						
• No	270	-2.0574	.07026	6.171*	-2.484*	
• Yes	280	-1.8125	.06920			
IG						
• Pre	462	-2.034	0.057	5.630*	2.373*	
• Post	489	-2.216	0.052			
CG						
• Pre	475	-1.895	0.053	10.8783**	3.297**	
• Post	439	-2.146	0.055			

Note: Figure in bracket indicates code mentioned against t-value

#Sample size small hence upper middle SES group merged with lower middle

$ Sample size small hence Graduate or post graduate merged with High school

Relationship Various Independent Variables and Mean HAZ Score

	HAZ					
	N	**Mean**	**SE**	**'F' Value**	**'T' Value**	
Wealth Index Kuppuswamy's Socioeconomic Status Scale, 2007						
• Lower Middle + Upper middle (3)[#]	14	-0.845	0.559	3.459*	1.974*	4 vs. 5
• Upper lower (4)	407	-1.431	0.065			
• Lower (5)	109	-1.711	0.129		-2.111*	3 vs. 5
Caste						
• General (1)	61	-0.460	0.148	18.101***	5.972***	4 vs. 1
• SC (2)	26	-0.954	0.277		-2.649**	3 vs. 4
• ST (3)	214	-1.796	0.098		-2.836**	2 vs. 3
• OBC (4)	263	-1.476	0.074			
Children Having Access and Using Household Toilet						
• No	448	-1.556	0.065	4.758**	-2.999**	
• Yes	111	-1.127	0.121			
Mother's Educational Score						
• Illiterate (1)	151	-1.749	0.111	5.435***	-1.975*	1 vs. 2
• Primary school (2)	254	-1.470	0.087			
• Middle school (3)	134	-1.264	0.110		3.345**	4 vs.1
• High school + (4)[$]	25	-0.777	0.240		2.422	4 vs. 2
Mother's Occupational Score						
• Unemployed (1)	520	-1.433	0.059	4.717***	2.663**	1 vs.2
• Unskilled worker (2)	4	-3.233	0.541			
• Semi-skilled worker (3)	14	-2.622	0.327		-2.454*	3 vs. 4
• Skilled worker (4)	3	-0.837	0.190			
• Clerical, Shop-owner, Farmer (5)	11	-1.168	0.398			
Sex						
• Female	420	-1.448	0.065	6.908**	-2.628**	1 vs. 2
• Male	503	-1.685	0.062			
Child's Age Group						
• 0 to 5 (5)	239	-0.919	0.085	54.054***	10.096***	5 vs.12
• 12 to 23 (12)	439	-1.991	0.063		4.862***	5 vs.6
• 6 to 11 (6)	245	-1.478	0.078		-4.992***	6 vs.12
LBW						
• Normal	332	-1.241	0.076	13.738***	-3.706***	
• LBW	111	-1.789	0.113			
Diarrhea						
• No	481	-1.427	0.062	4.430*	2.105*	
• Yes	82	-1.769	0.151			
• **Last *MAMTA DAY* attended**						
• No	271	-1.6169	.08203	5.528*	-2.351*	
• Yes	274	-1.3452	.08138			

Note: Figure in bracket indicates code mentioned against t-value
#Sample size small hence upper middle SES group merged with lower middle
$ Sample size small hence Graduate or post graduate merged with High school

Relationship Various Independent Variables and Mean WHZ Score

	WHZ					
	N	**Mean**	**SE**	**'F' Value**	**'T' Value**	
Wealth Index Kuppuswamy's Socioeconomic Status Scale, 2007						
• Lower Middle + Upper middle (3)#	14	-1.767	0.422	3.185*	2.436*	4 vs.5
• Upper lower (4)	408	-1.459	0.060			
• Lower (5)	106	-1.779	0.115			
Caste						
• General (1)	63	-1.468	0.163	2.378^{ns}	-2.391*	2 vs.3
• SC (2)	25	-1.086	0.239			
• ST (3)	210	-1.673	0.080			
• OBC (4)	266	-1.470	0.075			
Safety of drawing drinking water from the container						
• Unsafe	192	-1.807	0.079	9.496***	-4.286***	0 vs.1
• Safe	337	-1.347	0.067			
Child's Age Group						
• 0 to 5 (5)	242	-1.414	0.083	11.118***	3.430***	5 vs.12
• 12 to 23 (12)	440	-1.740	0.053			
• 6 to 11 (6)	247	-1.340	0.075		-4.397***	6 vs.12
Diarrhea						
• No	481	-1.473	0.054	5.099*	2.258*	
• Yes	81	-1.800	0.143			
EIBF						
• No	102	-1.596	0.129	4.053*	-2.013*	
• Yes	244	-1.302	0.078			
EBF						
• No	153	-1.252	0.103	6.162^{ns}	2.482*	
• Yes	70	-1.714	0.158			
GMP (previous month)						
• No	162	-2.0728	.08929	4.037*		
• Yes	388	-1.8527	.06018			
Baseline						
• IG	454	-1.743	0.054	23.949***	-4.894***	
• CG	475	-1.363	0.055			
CG						
• Pre	475	-1.363	0.055	18.090***	4.253***	
• Post	435	-1.688	0.052			

Figure in bracket indicates code mentioned against t-value
#Sample size small hence upper middle SES group merged with lower middle

Relationship Various Independent Variables and Mean MUACZ Score

	MUACZ					
	N	**Mean**	**SE**	**'F' Value**	**'T' Value**	
Wealth Index Kuppuswamy's Socioeconomic Status Scale, 2007						
• Lower Middle + Upper middle (3)#	11	-0.695	0.323	4.107*	2.750**	4 vs.5
• Upper lower (4)	334	-0.882	0.054			
• Lower (5)	83	-1.232	0.134			
Caste						
• General (1)	55	-0.513	0.123	7.024ns	2.654** -2.354* -2.623**	4 vs. 1 3 vs. 4 2 vs. 3
• SC (2)	22	-0.528	0.264			
• ST (3)	166	-1.163	0.081			
• OBC (4)	214	-0.913	0.069			
Mother's Educational Score						
• Illiterate (1)	119	-1.172	0.104	3.797**	-2.110*	1 vs.2
• Primary school (2)	202	-0.913	0.071			
• Middle school (3)	115	-0.722	0.088			
• High school + (4)$	22	-1.038	0.240			
Child's Age Group						
• 12 to 23 (12)	443	-1.190	0.050	10.323***	-4.349***	6 vs.12
• 6 to 11 (6)	244	-0.831	0.064			
Diarrhea						
• No	384	-0.859	0.052	17.457***	4.178***	
• Yes	74	-1.414	0.139			
GMP (previous month)						
• No	152	-1.1043	.08938	4.929*	-2.220	
• Yes	291	-.8678	.06120			
Last *MAMTA DAY* attended						
• No	227	-1.0988	.06913	8.580**	-2.929**	
• Yes	214	-.8094	.07056			
Baseline						
• IG	337	-1.208	0.058	13.444***	-3.667***	
• CG	353	-0.917	0.054			
Impact						
• IG	368	-1.026	0.054	11.116***	3.334***	
• CG	342	-1.273	0.051			
IG						
• Pre	337	-1.208	0.058	5.328*	-2.308*	
• Post	368	-1.026	0.054			
CG						
• Pre	353	-0.917	0.054	22.851***	4.780***	
• Post	342	-1.273	0.051			

Figure in bracket indicates code mentioned against t-value
#Sample size small hence upper middle SES group merged with lower middle
$ Sample size small hence Graduate or post graduate merged with High school

Factors Significantly Associated with Z Score - Multiple Regression Analysis

Step wise multiple regression was performed using the independent variable mentioned above with Z scores (WHZ, WAZ, HAZ and MUACZ) as dependent variables.

Since the age group assessed for EBF, EIBF, CF and *Balbhog* are different; each Z score was analyzed in three groups

- 0-6 mo. including EBF
- 0-12 mo. including EIBF
- 6– 23 mo. including CF at 6 mo. and *Balbhog* consumption in last 24 hours

Factors Significantly Associated with WAZ Score - Multiple Regression Analysis

Variable	***Adjusted R^2***	***SE***	***Variation Explained (%)***	***F***	***Sig.***
WAZ including EIBF					
LBW	*.107*	*0.99*	*10.7*	*27.283*	*.000[a] ****
Mother's education	*.130*	*0.98*	*2.3*	*17.420*	*.000[b]****
Sex	.145	0.97	1.4	13.337	.000[c]***
Caste	.156	0.97	1.2	11.125	.000[d]***
WAZ including EBF					
LBW	.231	0.96	23.1	44.829	.000[a]***
Wealth Index Kuppuswamy's Socioeconomic Status Scale, 2007	.251	0.94	2.0	25.463	.000[b]***
WAZ including CF and *Balbhog*					
Caste	.060	0.92	6.0	8.842	.004[a]**
Storage of Drinking Water (Container Covered And Kept On High Platform	.105	0.90	4.4	8.146	.000[b]***
Age in mo.	.129	0.89	2.4	7.031	.000[c]***
Safety of drawing drinking water from the container	.151	0.88	2.1	6.406	.000[d]***
Balbhog consumed in 24 hours preceding the survey	.171	0.87	2.1	6.048	.000[e]***

Factors Significantly Associated with WHZ Score - Multiple Regression Analysis

Variable	Adjusted R^2	SE	Variation Explained (%)	F	Sig.
WHZ including EIBF					
Safety of drawing drinking water from the container	.060	1.25	6.0	14.931	.000[a]***
WHZ including EBF					
Age in mo.	.061	1.33	6.1	10.390	.002[a]**
Safety of drawing drinking water from the container	.128	1.28	6.7	11.615	.000[b]***
Mother's Age group	.167	1.25	3.9	10.678	.000[c]***
WHZ Including CF and *Balbhog*					
Safety of drawing drinking water from the container	.054	0.98	5.4	7.982	.006[a]**
Age in mo.	.085	0.96	3.1	6.689	.002[b]**

Factors Significantly Associated with HAZ Score - Multiple Regression Analysis

Variable	Adjusted R^2	SE	Variation Explained (%)	F	Sig.
HAZ, including EIBF					
LBW	.074	1.24	7.4	18.298	.000[a]***
Caste	.126	1.20	5.2	16.606	.000[b]***
Age in mo.	.168	1.17	4.2	15.576	.000[c]***
HAZ, including EBF					
LBW	.158	1.18	15.8	27.931	.000[a]***
Caste	.179	1.17	2.1	16.664	.000[b]***
HAZ, including CF and *Balbhog*					
Storage of Drinking Water (Container Covered And Kept On High Platform	.083	1.24	8.3	12.025	.001[a]**
Caste	.151	1.20	6.8	11.834	.000[b]***
Cough	.184	1.17	3.3	10.145	.000[c]***
Balbhog consumed in 24 hours preceding the survey	.212	1.15	2.8	9.184	.000[d]***
Mother's education	.232	1.14	2.0	8.355	.000[e]***

Factors Significantly Associated with MUACZ Score - Multiple Regression Analysis

Variable	Adjusted R^2	SE	Variation Explained (%)	F	Sig.
MUACZ Including EIBF					
Age in mo.	.044	0.89	4.4	7.638	.006[a]**
Diarrhea	.076	0.87	3.2	6.928	.001[b]**
Safety of drawing drinking water from the container	.095	0.86	1.9	6.045	.001[c]**
MUACZ. Including CF and *Balbhog*					
Diarrhea	.058	0.81	5.8	8.538	.004[a]**
Mother's Occupation	.092	0.79	3.4	7.179	.001[b]**
MUACZ. Including EBF					
Mother's Age group	.080	0.89	8.0	7.267	.009[a]**
LBW	.130	0.87	4.9	6.358	.003[b]**

Annexure 13: Change in IYCF Knowledge and Perceptions of Pregnant Mothers

Pregnant Mothers'	Pre		Post		Diff (Pre Post)		Diff	x^2			
	IG	CG	IG	CG							
N	**N=53**	**N=53**	**N=37**	**N=42**	**IG**	**CG**	**IG-CG**	**Pre**	**Post**	**IG**	**CG**
EIBF	34.0(18)	45.3(24)	56.8(21)	59.5(25)	167.1	131.3	35.7	1.42	0.06	4.61*	1.90
Colostrum Feeding	39.6(21)	43.4(23)	64.9(24)	61.9(26)	163.9	142.6	21.3	0.16	0.07	5.55*	3.21
Prelacteal Feeding	20.8(11)	20.8(11)	48.6(18)	35.7(15)	233.7	171.6	62.0	0.00	1.35	7.76**	2.64
Duration of EBF	20.8(11)	26.4(14)	37.8(14)	52.4(22)	181.7	198.5	-16.8	0.47	1.68	3.17	6.71**
Duration of BF with CF	11.3(6)	15.1(8)	16.2(6)	14.3(6)	143.4	94.7	48.7	0.33	0.06	0.45	0.01
BF on a time schedule	49.1(26)	45.3(24)	70.3(26)	64.3(27)	143.2	141.9	1.2	0.15	0.32	4.02*	3.40
BF on demand day and night	41.5(22)	45.3(24)	29.7(11)	33.3(14)	71.6	73.5	-1.9	0.15	0.12	1.30	1.39
BF min. 8-12 times in a day	24.5(13)	30.2(16)	29.7(11)	42.9(18)	121.2	142.1	-20.8	0.43	1.46	0.30	1.64
BF min. 20- 30 minutes each time	24.5(13)	24.5(13)	21.6(8)	19.0(8)	88.2	77.6	10.6	0.00	0.08	0.10	0.41
Offer another breast after one breast is empty	83.0(44)	90.6(48)	89.2(33)	97.6(41)	107.5	107.7	-0.3	1.32	2.36	0.67	1.97
BF every time from different breasts	62.3(33)	79.2(42)	89.2(33)	85.7(36)	143.2	108.2	35.0	3.69	0.22	8.08**	0.67
Indicators about "Not Enough Breast Milk" (Weight)	1.9(1)	-	-	-	-	-	-	1.01	-.	0.71	-.
Mother should take extra diet during pregnancy and lactation	37.7(20)	67.9(36)	64.9(24)	69.0(29)	172.1	101.6	70.5	9.69**	0.16	6.42*	0.01
BF help in delaying next pregnancy	13.2(7)	11.3(6)	21.6(8)	28.6(12)	163.6	253.1	-89.5	0.09	0.50	1.11	4.54*
Mother should/can continue to BF the child when pregnant	34.0(18)	18.9(10)	21.6(8)	14.3(6)	63.5	75.7	-12.1	3.11	0.73	1.62	0.35
BF helps mothers' to lose weight	39.6(21)	56.6(30)	56.8(21)	66.7(28)	143.4	117.8	25.6	3.06	0.82	2.57	1.00
Overall % Change					**131.7**	**121.1**	**10.6**				
Frequency of GMP	35.8(19)	32.1(17)	37.8(14)	59.5(25)	105.6	185.4	-79.8	0.17	3.70	0.04	7.16**
Imp. to monitor child's growth	66.0(35)	75.5(40)	81.1(30)	95.2(40)	122.9	126.1	-3.2	1.14	3.91*	2.46	6.89**

Annexure 14: Change in IYCF Knowledge and Perceptions of Lactating Mother's

	Pre		Post		Diff			x^2			
	IG	CG	IG	CG							
Lactating Mothers' (N)	**N=175**	**N=177**	**N=190**	**N=170**	**IG**	**CG**	**IG-CG**	**Pre**	**Post**	**IG**	**CG**
Duration of EBF	42.9 (75)	45.8 (81)	66.3 (126)	60 (102)	154.5	131	23.5	0.3	1.54	20.26***	7.05**
Duration of BF with CF	18.3 (32)	15.3 (27)	17.4 (33)	20.6 (35)	95.1	134.6	-39.6	0.58	0.61	0.05	1.68
Breastfeeding on a time schedule	68.0 (119)	75.7 (134)	81.6 (155)	87.1 (148)	120	115.1	4.9	2.59	2.02	8.98**	7.34**
Breastfeeding on demand day and night	28.0 (49)	23.2 (41)	16.8 (32)	12.9 (22)	60	55.6	4.4	1.08	1.07	6.57*	6.10*
Breastfeeding 8 – 12 times in a day	38.6 (66)	47.2 (83)	53.7 (102)	50 (85)	142.4	106.6	35.8	3.04	0.49	9.35**	0.34
Breastfeeding minimum 20- 30 minutes each time	26.3 (46)	32.2 (57)	28.9 (55)	21.2 (36)	109.9	65.8	44	1.49	2.87	0.32	5.38*
Offer another breast after one breast is empty	86.9 (152)	92.1 (163)	88.9 (169)	96.5 (164)	102.3	104.8	-2.5	2.56	7.32**	0.38	3.06
Breastfeeding every time from different breasts	76.0 (133)	81.4 (144)	83.7 (159)	92.9 (158)	110.1	114.1	-4.0**	1.51	7.31**	3.36	10.31**
Indicators about "Not Enough Breast Milk" (Weight)	-	-	0.5 (1)	-	-	-	-	-	-	-	-
Mother should take extra diet during pregnancy and breastfeeding	73.1 (128)	83.6 (148)	84.2 (160)	90.0 (153)	115.2	107.7	7.5	5.70*	2.65	6.70**	3.07
Breastfeeding help in delaying the next pregnancy	9.1 (16)	10.7 (19)	17.9 (34)	21.8 (37)	196.7	203.7	-7.0**	0.25	0.85	5.90*	7.80**
Mother should/can continue to feed the child even when she is pregnant again	26.9 (47)	20.3 (36)	20.5 (39)	32.4	76.2	159.6	-83.4*	2.08	6.51*	2.03	6.47*
Breastfeeding helps mothers' to lose weight	35.4 (62)	40.7 (72)	48.9 (93)	57.1 (97)	138.1	140.3	-2.2**	1.03	2.37	6.81**	9.31**

	Pre		Post		Diff			x^2			
	IG	CG	IG	CG							
Lactating Mothers' (N)	**N=175**	**N=177**	**N=190**	**N=170**	**IG**	**CG**	**IG-CG**	**Pre**	**Post**	**IG**	**CG**
Complementary feeding											
Age (mo.) of introduction of Top milk (U-6 mo.)	110 19.1 (21)	117 29.1 (34)	115 35.7 (41)	95 37.9 (36)	186.9	130.2	56.7	3.07	0.11	7.73**	1.85
Age (mo.) of Introduction of CF	110 29.1 (32)	117 29.9 (35)	115 39.1 (45)	95 47.4 (45)	134.4	158.5	-24.2	0.02	1.44	2.52	6.80**
Age (mo.) of Introduction of food from family pot or meal (U-12 mo.)	176 18.8 (33)	181 17.1 (31)	193 29.0 (56)	172 31.4 (54)	154.3	183.6	-29.4	0.16	0.25	5.30*	9.82**
Constancy of Complementary Food (U-6 mo.)	110 18.2 (20)	117 21.4 (25)	115 27.8 (32)	95 12.6 (12)	152.7	58.9	93.9	0.36	7.25**	2.94	2.78
CF frequency (no.) 7-11 mo.	176 54.0 (95)	181 66.3 (120)	193 66.8 (129)	172 76.7 (132)	123.7	115.7	8	5.66*	4.38*	6.38*	4.71*
CF frequency (no.) 12-23 mo. (U-12 mo.)	176 35.8 (63)	181 47.5 (86)	193 36.8 (71)	172 59.3 (102)	102.8	124.8	-22	5.04*	18.49***	0.04	4.92*
Age (mo.) when a child can eat by self (U-2 yrs)	176 29.5 (52)	181 40.3 (73)	193 36.3 (70)	172 25.6 (44)	123.1	63.5	59.5	4.56*	4.84*	1.88	8.66**
Important to sit and monitor the child while eating (U-2 yrs)	287 78.0 (224)	287 88.2 (253)	304 83.9 (255)	278 91.4 (254)	107.6	103.6	3.9	10.43**	7.42**	3.27	1.58
Care while feeding Child recovering from illness	288 26.4 (76)	287 22.3 (64)	304 46.1 (140)	278 47.5 (132)	174.6	213	-38.4	1.31	0.12	24.68***	39.53***
Overall % Change					**121.8**	**117.8**	**4.1**				
GMP											
Freq of GMP	52 (91)	54.2 (96)	53.2 (101)	62.9 (107)	102.3	116.1	-13.7	0.18	3.52	0.05	2.71
Important to monitor child's growth	77.1 (135)	81.9 (145)	88.9 (169)	90.6 (154)	115.3	110.6	4.7	1.24	0.26	9.12**	5.47*

* Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001

Annexure 15: Change in Knowledge and Perceptions about IYCF practices of Pregnant and Lactating Mother's

	Pre			Post		
	IG (Mean±SD)	CG Mean±SD	T-value (CI of diff)	IG (Mean±SD)	CG Mean±SD	T-value (CI of diff)
Breastfeeding						
Lactating Women						
Valid (N)	123	149		166	162	
EBF (mo.)	5.49±3.06	4.52±2.01	3.120**	5.30±1.80	4.86±1.78	2.355*
T-Value #	0.560^{NS}(IG)-1.585^{NS} (CG)					
Valid (N)	145	151		145	145	
Age for continue BF (mo.)	17.80±7.84	17.48±9.88	0.311 ^{NS}	15.26±9.48	17.41±8.81	-1.995*
T-Value #	2.484**(IG) 0.064^{NS}(CG)					
Valid (N)	127	148		157	155	
Breastfeeding Frequency (no./day)	8.98±3.76	9.67±3.70	-1.52^{NS}	9.59±3.42	9.72±4.37	-0.293^{NS}
T-Value #	-1.409^{NS}(IG) -0.101^{NS}(CG)					
Valid (N)	153	164		174	164	
Breastfeeding Duration (minutes)	23.46±18.11	24.34±18.41	-0.424 ^{NS}	23.14±18.30	19.60±16.89	1.842 ^{NS}
T-Value #	0.162 ^{NS}(IG) 2.426*(CG)					
Pregnant Women						
Valid (N)	26	42		27	37	
EBF (mo.)	4.31±2.43	4.19±2.56	0.187 ^{NS}	5.81±4.29	5.41±4.71	0.36 ^{NS}
T-Value #	-1.566^{NS}(IG) -1.499 ^{NS} (CG)					
Valid (N)	36	48		31	34	
Age for continue BF (mo.)	18.64±13.21	15.31± 6.06	I.543 ^{NS}	14.68±11.48	14.56±5.80	0.053 ^{NS}
T-Value #	1.300 ^{NS} (IG) 0.565 ^{NS} (CG)					
Valid (N)	31	36		22	28	
Breastfeeding Frequency (no./day)	7.55±3.58	10.33±9.67	-1.52^{NS}	8.95±4.79	8.50±2.52	0.433 ^{NS}
T-Value #	-1.23 ^{NS} (IG), 0.98 ^{NS}(CG)					
Valid (N)	31	26		44	30	
Breastfeeding Duration (minutes)	18.23±12.29	19.85±14.96	-0.413 ^{NS}	19.73±17.40	17.60±14.96	0.560 ^{NS}
T-Value #	-0.449 ^{NS} (IG), 0.546^{NS} (CG)					

	Pre			Post		
	IG (Mean±SD)	CG Mean±SD	T-value (CI of diff)	IG (Mean±SD)	CG Mean±SD	T-value (CI of diff)
Complementary Feeding						
Valid (N)	66	85		89	75	
Age (mo.) of introduction of Top milk (U-6 mo.)	9.56±9.18	8.41±9.00	0.771^{NS}	6.57±4.90	6.83±5.73	-0.306^{NS}
T-Value #	IG: 2.612* , CG 1.309^{NS}					
Valid (N)	96	95		89	82	
Age (mo.) of Introduction of CF (U-6 mo.)	8.41±3.19	7.32±2.34	2.691^{NS}	7.18±2.22	7.32±2.48	-0.382**
T-Value #	IG: 3.01** CG: -0.04^{NS}					
Valid (N)	117	140		159	153	
Age (mo.) of Introduction of food from family pot or meal (U-12 mo.)	19.51±11.27	24.56±12.16	3.422***	18.22±10.36	15.53±9.41	-2.39*
T-Value #	IG: 0.99^{NS}; CG:7.14***					
Valid (N)	62	142		151	161	
CF frequency (no.) 7-11 mo. (U-12 mo.)	2.79±2.14	3.45±1.03	2.97**	2.87±1.26	2.91±1.69	0.23^{ns}
T-Value #	IG:-0.35^{NS} CG 3.38***					
Valid (N)	94	123		119	149	
CF frequency (no.) 12-23 mo. (U-12 mo.)	4.01±1.72	4.47±1.51		8.49±16.61	4.30±2.61	
T-Value #						
Responsive Feeding						
Valid (N)	118	143		153	153	
Age (mo.) when a child can eat by self (U-2 yrs)	25.9±13.78	28.54±14.36	-1.391 ^{NS}	23.62±12.02	18.75±10.75	1.178^{NS}
T-Value #	IG: 1.63^{NS} CG:4.45***					

Independent T-test (equal variance) * Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001

Annexure 16: Cluster-wise Improvement in Undernutrition among Children Under Two Years

Clusters (AWC)	Underweight WAZ <-2SD		Stunting HAZ<-2SD		Wasting WHZ <-2SD		MUAC <-2SD	
	Percent Change							
	IG	CG	IG	CG	IG	CG	IG	CG
1	133	188	200	187	270	64	90	106
2	130	106	115	175	151	47	249	80
3	167	165	105	88	266	98	282	54
4	179	84	93	52	47	75	115	106
5	99	195	95	202	114	185	42	1158
6	101	189	158	139	71	263	0 to 18.20	383
7	61	115	21	186	73	90	0	165
8	126	50	90	94	75	53	133	48
9	119	145	116	135	131	135	155	1002
10	84	117	72	78	106	182	48	207
11	110	112	95	112	92	113	66	106
12	84	122	76	108	90	61	72	0
13	74	128	135	126	97	129	540	136
14	121	142	109	73	182	181	0	127
15	225	119	508	117	85	154	169	447
16	131	150	78	127	150	193	106	159
17	112	80	86	73	79	107	118	185
18	115	-	151	-	72	-	120	-
19	132	-	113	-	87	-	68	-
Total	113	123	106	108	108	125	104	167

Baseline & Impact Assessment

In-depth interview of AWWs

Tools for Data Collection

In-depth interview of Mothers' of Children Under 2 years and Pregnant Women

MUAC Measurement

Lenght Measurment

Follow-up of Children born to Pregnant Women Cohort

Development of Training Module & Tools

Pre testing of IYCF flip charts

Pre-testing of Semi Structured Questionnaire for Mothers of children U-2 years & practice of taking Anthropometric Measurements

Capacity Building of AWWs of GMP and IYCF

AWWs practicing plotting on MAMTA card growth chart and community growth chart

Training of AWWs on use of IYCF guidelines from MAMTA Card

Supervisor participation in Capacity building

Role play on Key IYCF message Chart

Hands-on-Training on use of IYCF Flip

Process Evaluations by Concurrent Assessment

Weighing of children U-2 years followed by Counselling of Mother's on MAMTA DAY

Counselling of Mother's of U-2 on IYCF & Pregnant women

Counselling of Mother's of U-2 by AWWs, ASHA and Village Volunteers

Community Growth Monitoring on MAMTA day and Group Counselling


Home Visit of New born and Counseling on IYCF

Home visit of Children U-2 years and IYCF counselling


Group Counselling by ICDS Supervisors

Some Challenges ahead……..

DOB- 29/8/2009

22/4/2010 – 7 months & 21 days; 5.750-kg, 63.50 ht, MUAC - 12.8 (Green)

15/9/2010 – 1 year & 17 days; 5.8 kg, ht 68, MUAC 11.7 (yellow)

27/10/10 – 1 year and 1 month and 28 days

5.8 kg, ht 68, MUAC 11.7 (yellow)

Water and Sanitation during Monsoon

He stays few km from taluka town……..

RESEARCH PUBLICATIONS

Paper Publications

- *Knowledge & Perceptions Of ICDS Anganwadi Workers With Reference To Promotion Of Community Based Complementary Feeding Practices In Semi Tribal Gujarat* - National Journal Of Community Medicine; Vol-2, Issue-3, Oct-Dec 2011.

Presentation in Conference

World Breast Feeding Conference- Poster Presentations

- *"Infant feeding practices in Semi Tribal ICDS Blocks of Gujarat"* displayed at The World Breastfeeding Conference 2012" at New Delhi, 6-9 December, 2012.

- *"Association of infant feeding practices and under nutrition among children under two in Semi Tribal ICDS Blocks of Gujarat"* displayed at The World Breastfeeding Conference 2012" at New Delhi, 6-9 December, 2012.

- *"Impact of Capacity Building of ICDS AWWs on IYCF practices of children under two years in Semi Tribal ICDS Blocks of Gujarat"* displayed at The World Breastfeeding Conference 2012" at New Delhi, 6-9 December, 2012.