7. SUMMARY AND CONCLUSIONS

Great stride has been made since last fifty years in dealing with the problem of hunger in large part of world because of improved agricultural technologies. Technological change in agriculture has markedly reduced poverty in Asia and other parts of third world. Despite such break through in agricultural production, malnutrition remains problem for a large number of people. This state of affair undoubtedly reflects that there exists some vital missing link which is responsible for such widespread nutritional problem. In fact, a wide gulf separates the science of nutrition as established by the research and the application of this science to feeding of individuals and groups. This gulf between nutrition science and its application appear to be one of the major causes of malnutrition. This gulf can be bridged only if nutrition education is adopted at all the levels.

Despite the impressive growth in agricultural production, still India's Human Development Index is among the lowest (134th) and of the total population, 37.4 % are below poverty line. About India the bitter facts are that, it has the largest number of malnourished children in the world today; eighty five per cent Indian women population is anaemic due to the denial of proper nutrition in their growing and child bearing years; infant mortality rate is 94 per 1000 live births; and many other nutritional disorders like PEM, endemic flurosis, vitamin - A deficiency, endemic goiter, etc. also afflict a large segment of Indian population. Thus with a population of 900 million, of whom 50 per cent are illiterate, the nutritional problems faced by the country are multidimensional. In fact, illiteracy is closely related to poverty, hunger, underdevelopment and malnutrition problems in our country.

It is not that our central and state Governments are non serious about the situation of Indian population on nutritional front. In the year 1993, Government of India adopted **National Nutrition Policy** followed by the adoption of **National Plan of Action** on Nutrition in 1995. In national nutrition policy and national plan of action on nutrition two most important interventions recommended to improve the nutritional status of masses are :

» *Empowering mothers with nutrition and health education* and

» *Enlisting better community participation through health and nutrition education by involving community based monitoring system in management of nutrition.*

The emphasis given in said two fronts i.e., nutrition education to mothers and community participation in the programmes of nutrition education itself reflects the seriousness on the parts of policy makers, planners and administrators as far as formulation and execution of nutritional education programmes are concerned.

In true sense, mothers are the first teacher of children. If a mother has knowledge of nutrition, the same will filter down from one generation to other and so on. The literacy rate of women in rural sector of India is only 13.2% as against 42.3% in urban sector and naturally rural women often do not have even little functional knowledge regarding nutrition and its importance.Against this background, the present investigation was taken up in rural settings of parts (*Thar* desert region) of Rajasthan, which ranked 29th in over all literacy rates among the various states and union territories of the country. *Thar* desert region has long history of early and child marriages and 80 % adolescent girls are reported to be anaemic .

To educate the vast rural communities regarding importance of nutrition, especially to illiterate subjects only possible way is to impart informal education through such nutritional awareness campaigns which have sufficient components of indigenous strategy. In this context, role of different varieties of communication media (like video and traditional folk songs) and arts to impart informal education can play a very important role.

In light of all above mentioned facts, the present investigation was planned by taking adolescent girls of rural communities of *Thar* desert region

as target group; anaemia a highly prevalent malnutrition related disease in this segment of population as nutritional disorder; and video and folk songs (educational songs composed in famous folk musical tunes of *Thar* desert) as instructional tools for imparting functional nutrition education on anaemia.

7.1 ABOUT THE NUTRITIONAL DISORDERS 'ANAEMIA' AND TARGETED POPULATION OF PRESENT STUDY

It is recognised that widespread anaemia prevalent among various segment of our population is largely due to economic factors. However, it can not be denied that social and cultural factors also contribute significantly to overall picture of anaemia in India. It is very disgusting that despite adequate food availability in our country, our masses are not able to maintain required nutritional status . As mentioned earlier the present problem for investigation was targeted on adolescent girls because morbidity and mortality of adolescent girls is an area of concern to everyone in society. But, such a vital issue has not been identified as a problem in a number of countries including India till recent past . Therefore, only very limited experience is available in developing to deal with such a vital issue of deep concern.

7.2 CURRENT TRENDS IN NUTRITION EDUCATION

It is beyond doubt that multifaceted researches in the field of formal and informal education in India and elsewhere are gaining sufficient momentum and various teaching techniques at almost all the levels of education are undergoing radical changes in past few years. Educational practitioners have

now turned their faces towards developing such teaching strategies which when used for different target groups and subjects, and situations, ensure better learning with greater interactions on one hand and maximum attainment of instructional objective on the other . However, in the domain of science and art of nutrition, especially in community nutrition most of the studies are limited upto assessment of nutritional status or nutritional patterns. The studies on nutrition education are restricted to different teaching methods and their importance to increase the knowledge of nutrition as a subject in school, college or university level. In fact, there is dearth of literature specially in community nutrition, where attempts have been made to impart functional nutrition education to different target groups (for different nutritional problems) through innovative educational methods.

7.3 STATEMENT OF THE PROBLEM

The title of the present study has been worded as follows :

NUTRITION EDUCATION ON ANAEMIA THROUGH VIDEO AND FOLK SONGS AMONG ADOLESCENT GIRLS OF *THAR* DESERT (RAJASTHAN).

7.4 OBJECTIVES

Following are the major objectives of present investigations which was carried out in arid and semi-arid zones of *Thar* desert (involving two villages from each region).

1. To prepare and produce a comprehensive video programme for imparting education on etiology of anaemia and its prevention, treatment and

control. Also to compose and record the educational songs in same time on the tunes of some famous folk songs of *Thar* desert region.

2.To determine the impact of intervention on anaemia in target population (adolescent girls) through : supplementation of iron folate tablets : nutrition education through folk songs ; nutrition education through video; and through nutrition education by folksongs and video programme in combination with iron folate supplementation.

3.To compare the relative effectiveness of above mentioned strategies to control the anaemia among target population group.

4.To assess whether or not varied climatic conditions and cropping systems have relation with nutritional status of target group population, specifically in the context of anaemia.

7.5 METHODOLOGY AND EXECUTION OF RESEARCH PLAN

For designing and executing present research plan, following major aspects have been covered :

- Sampling

- Development of instructional tools

- Development of test tools

- Haemoglobin estimation

- Experimental design and Execution of research plan

- Data analysis

7.5.1 Sampling

Sampling in the study has been done to select a number of adolescent girls from rural communities of Thar desert in such a way that the girls represent the larger group from which they were identified.Since all the members of selected group had similar characteristics, cluster sampling method was followed.Four villages i.e. Mogra Kalan and Sekhala from Jodhpur district (arid zone) and Gundoj and Nimmera Kalan from Pali district (semi-arid zone) were identified. In each village 120 adolescent girls formed the sample.

7.5.2 Development of Instructional Tools

Two educational tools i.e., an educative video programme and three educative songs in the popular folk music.Style of *Thar* deserts inhabitants were developed to impart functional nutrition education on anaemia to adolescent girls of rural communities of *Thar* desert.

Video Programme

An instructional video programme was developed with assistance of educational Media Research Center (EMRC) Jodhpur. Most advanced equipment i.e. Beta cam were used in preparation of video programme, which can withstand 20 generation losses.A careful survey of literature on Anaemia was carried out and all facts and figures concerning to anaemia were included in the programme.The programme covered the meaning, causes, prevention and control of anaemia through interview, demonstra-

tion, and graphics method. The programme was produced in English and Hindi language.

Folk Songs

The very rich folk music of Rajasthan, especially that of Marwar region which constitute the larger chunk of *Thar* desert is acknowledged internationally.Three educative songs (highlighting the problem of anaemia its consequences and step needed for its prevention and control) on the basis of musical style of three prominent folk songs of *Thar* desert region were composed.

7.5.3 Development of Test Tools

For collection of data two different schedules were prepared:

» Primary survey schedule

» Pre and Post knowledge test schedule.

The primary survey schedule was developed to collect primary information regarding family food habits, occupation, education and health of participant.The pre and post knowledge test schedule which guided the study was formulated through extensive literature survey and consultation with educational practitioners.The questions in said schedule broadly covered four major aspects viz. (1) What is anaemia?, (2) What are the reasons responsible for anaemia?,(3) What are the symptoms of anaemia and (4) What is the treatment of anaemia?. The scoring ranged between 0-24

in both pre and post knowledge test.The same schedule was used for testing pre and post knowledge of the participants.

7.5.4 Haemoglobin Estimation

Nutritional deficiency as a result of inadequate intake of food is major contributing factor in iron deficiency anaemia in women and children.As 60-70% of total iron content of body is contained in haemoglobin of red cells, therefore haemoglobin estimation of participants of the study was carried out before giving any educational treatment and after administering treatments as per study design.The method followed for estimating the haemoglobin of participants of the study is known as Sahli's haemometer method.

7.5.5 Experimental design and Execution of Reserach Plan

The study was designed for four villages of *Thar* desert of which two were located in arid zone and two in semi arid zone. After development of instructional and experimental tool the experiment was started in the identified villages.First of all primary survey was done by contacting heads of the families and selected participants in each selected village.This was followed by haemoglobin estimation of 120 selected girls in each village.After this task selected girls were subjected to pre knowledge test by administering developed pre and post knowledge test schedule.Then 120 girls in each village were subdivided into three groups of 40-40-40 according to experimental design. In both the zones (arid and semi arid) in one village

education was given through developed video programme (treatment-T2) and in another education was given through developed educational folk songs (treatment - T4). The village in which education was given through video programme, another treatment was combination of video education and iron folate supplementation (treatment- T3). The village where educational songs were used as a medium for imparting education, the another treatment was the combination of educational folk songs and iron folate supplements(treatment - T5) . One treatment i.e. simple iron folate supplementation without any kind of education formed the third treatment (treatment - T1) and was same to all the four villages.

After 90 days (3 months), of educational intervention and distribution of iron folate tablets, haemoglobin of each participating girl in each village was tested. Post intervention haemoglobin testing was followed by the knowledge gain test of participating girls.

7.5.6 Data Analysis

The collected data was analysed through statistical techniques.Descriptive statistics, frequency distribution, 't' test of significance between pre and post haemoglobin level and knowledge level of participants regarding anaemia, and analysis of variance for assessing the significance of treatments employed within a village and their impact on haemoglobin level were computed using statistical package 'Microstat', The analysis of variance for testing the set hypotheses was computed using statistical package 'TWFF. BKM'in basic language by slight modification in research design as per need of the computer programme.

7.6 MAJOR FINDINGS

The present study is an action oriented research plan in which innovative educational tools (video and folk songs) have been used with or without iron folate supplementation to assess the relative effectiveness of various strategies to increase the haemoglobin level and knowledge on various aspects of anaemia of adoloscent girls of *Thar* desert region. The majority of participants were illiterate and anaemic irrespective of zone and villages. The economy of all the villages were agrarian. Data on background information of participants revealed that overall economic structure and literacy level of semi-arid villages (Gundoj and Nimmera Kalan) were relatively better than the arid villages (Mogra Kalan and Sekhala). From the data gathered, it was also evident that due to relatively favourable climatic condition and better irrigation facilities in semi-arid villages, the intensity of cultivation and crop diversification were of higher order than arid villages.

As far as food habits of participant adoloscent girls were concerned, 80 % were non-vegetarian in all the selected villages. In all the villages, participant predominantly belonged to farming community. The better crop production in semi-arid villages was directly related with better economies of farmers. The relative resource richness of farmers in semi-arid zone villages positively influenced the pace of developmental activities and can be seen in form of better educational facilities, satisfactory health care facilities, better civic amenities, etc. Recent researches have also indicated that cropping patterns, crop production, climatic variation and agro-ecological

conditions of terrain had direct impact on physical status of women and children.

7.6.1 Haemoglobin Level of Participants and Impact of Intervention

From the data gathered through the present study it was apparent that all the treatment employed improved the haemoglobin level of participants. The education on anaemia through video and education on anaemia through folk songs which were educational strategies only succeeded in improving haemoglobin level of participants in respective villages where the treatments were employed. The combination of education on anaemia through video and iron folate supplementation, and the combination of education through folk songs and iron folate supplementation were found to be most effective treatments for increasing the haemoglobin level of participants. This fact was clearly visible in pre-intervention frequency distribution of participants under different limits of haemoglobin, which shifted to higher class limits of haemoglobin after intervention. The widely prevalent nutritional anaemia in rural women and children of *Thar* desert regions is a matter of great concern. The government of Rajasthan state run iron supplementation programme under National Anaemia Prophylaxis programme for women and children, where iron folate tablets are distributed free of cost has failed to produce desired results. The lack of basic knowledge on anaemia and its consequences appeared to be fundamental cause of failure of this novel scheme.

The present study clearly demonstrated if education component is

included with supplementation the benefits accrued are far more greater than simple supplementation.

7.6.2 Participants Knowledge Level in Respect of Anaemia and Impact of Interventions.

Like in case of improvement in haemoglobin level, the knowledge of participants of anaemia, its consequences and its prevention and control increased to an impressive limit when nutrition education on anaemia (through video and folk songs) was combined with iron folate supplementation. It is interesting to note that only educational treatment though substantially increased the knowledge level of participants but in not a single village of present study this strategy could match the post-intervention knowledge test scores of participants of treatment groups, where education was combined with supplementation.

It appears when nutrition education through innovative instructional tools like video and folk songs was combined with medical intervention (iron folate supplementation) the target population become more receptive, which in turn facilitate adequate follow up of interventions. This ultimately resulted in appreciable increase both in knowledge and haemoblogin level of participants.

On comparing the impact of nutrition education on anaemia through video with iron folate supplementation and impact of traditional medium like folk songs as instructional tool for nutrition education on anaemia also with combination of iron folate supplementation, it was discernible that former

strategy was more effective in terms of both knowledge gain and improvement in haemoglobin level of participating adoloscent girls.

7.6.3 Hypotheses

Two major hypotheses were formulated for present investigation. **Hypothesis I** states that there is a significant difference in anaemia and related knowledge of adolescent girls who received iron folate supplementation alone and those who receive it with planned education programme. The **Hypothesis II** states that there is significant difference on impact of planned educational programme in combination with iron folate supplementation for controlling anaemia of adolescent girls in semi-arid zone as compared to arid zone. To test **Hypothesis I**, eight sub-hypotheses in null form were formulated and to test **Hypothesis II**, to sub- hypotheses in null form were drived. Following are the findings which emerged through testing of these null hypotheses.

» Planned nutrition education on anaemia improves the haemoglobin level of adolescent girls in arid zone.

» Planned nutrition education on anaemia improves the haemoglobin level of adolescent girls in semi-arid zone.

» Planned nutrition education on anaemia along with iron folate supplementation improves haemiglobin level of adolescent girls in arid zone.

» Planned nutrition education on anaemia along with iron folate supplemen-

tation improves haemoglobin level of adolescent girls in semi-arid zone.

» Nutrition education on anaemia improves knowledge of adolescent girls in arid zone.

» Nutrition education on anaemia improves knowledge of adolescent girls in semi-arid zone.

» Planned nutrition education on anaemia along with iron folate supplementation improves knowledge of adolescent girls in arid zone.

» Planned nutrition education on anaemia along with iron folate supplementation improves knowledge of adolescent girls in semi-arid zone.

» The impact of video educational programme in combination with iron folate supplementation for controlling anaemia in adolescent girls is significantly higher in semi-arid zone as compared to arid zone'.

» The impact of educational folk songs in combination with iron folate supplementation for controlling anaemia in adolescent girls is significantly not higher in semi-arid zone as compared to arid zone.

Within a zone planned nutrition education programme on anaemia, alone helped the participants in increasing their haemoglobin level.This

clearly demonstrated the potential of mass media like video and traditional folk songs (composing particular message in the style and tune of popular folk songs of a particular region) to communicate the messages related to nutritional problems and their prevention and control. In the present study, majority of participants in each village were suffering from nutritional anaemia but, after exposing them to simple nutrition education on the subject, they began to improve their haemoglobin level by modifying their behaviour and attitude in respect to correction of their diet. This finding suggested that non-formal approach to health education has to take the form of community education with focus on needs and nature of clientele groups. Video and traditional medium like folk songs are very effective approaches for communicating with community. In fact, it is absolutely essential to use simple innovative instructional tools (like video and folk songs used in present study) with appropriate messages regarding nutrition and health as an integrated component of rural upliftment schemes of national and state governments.

When education on anaemia either through video or folk songs along with iron folate supplementation was imparted, the participants in arid and as well as semi-arid zone were benefited most both in terms of haemoglobin level improvement and gain in knowledge on anaemia. The results of present study demonstrated that if nutrition education is combined with medical interventions, the target population become more receptive which in turn facilitate adequate follow up of interventions.

If we look at the whole scenario of haemoglobin level and knowledge of participating adolescent girls in arid and semi arid zone (irrespective of

villages and treatments), it is apparent from the data gathered that both haemoglobin and knowledge level of participants were significantly higher in semi arid zone than that of arid zone. This relatively higher haemoglobin level and knowledge on various aspects of anaemia among the participating adolescent girls of semi-arid zone as compared to arid zone can be attributed to relatively better female literacy rate, better education and health facilities, favourable agro-climatic condition and better crop production, and better access to all sorts of communication modes in semi-arid villages.

7.7 CONCLUSIONS

The present study tried to examine the effectiveness of innovative educational tools like video and educational folk songs alone and in combination of iron supplementation to increase the blood haemoglobin level and also to improve the knowledge of adolescent girls on anaemia, a widely prevalent nutritional disorder in arid and semi-arid zones of *Thar* desert region. The majority of participants in the present investigation were more or less anaemic. The major conclusions stem from present investigation are as follows.

» The study indicated that in *Thar* desert region majority of rural woman folk are suffering from moderate to severe nutritional anaemia. This is a matter of great concern for planners, policy makers and administators. Immediate attention is needed to prevent and control this nutritional disorder.

» The video programme and educational folk songs used as instructional

tools in present investigation to impart nutrition education to illiterate adolescent girls in rural communities of *Thar* desert region proved to be very effective. When the education component was combined with iron supplementation, the participants succeeded in increasing their haemoglobin level and knowledge on anaemia many folds higher in comparison to either simple iron folate supplementation or simple educational treatments. This calls for immediate planning on the part of governments of India and various state governments to include nutrition education in form of functional nutrition education in their rural development, poverty alleviation and nutritional intervention programmes.

» The study indicated that climatic and agro- ecological conditions also play very important role as far as nutrition status of population is concerned. In present investigation participants of selected villages of semi-arid zone which had relatively favourable climatic and agro-ecological conditions than that of arid zone villages, exhibited over all better haemoglobin level and as well as better knowledge on various aspects of anaemia. More over, they were found to be relatively more receptive to interventions. Therefore, nutrition education especially for rural folks should be flexible and must be tailored and adopted to suit the local needs. The concept of areas or sector planning should be incorporated rather than enforcing rigid conformity and uniformity.

» As vast majority of villagers in our country are illiterate, more over, literacy rate of rural women is pathetic, therefore, in such situation, the functional nutrition education programme for rural woman folk should also have

indigenous component, like folk songs etc., as they are by and large very fond of this kind of entertainment. However, the desired message should be incorporated in such a manner that the audience could understand it easily, other wise they will loose their interest in the programme and this will ultimately hinder the effective communication of message.