

LIST OF FIGURES

Sr. No.	Title of figures	Page No.
1.	Introduction	
1	Summary of thyroid hormone production and regulation	3
2	Distribution of infants born in developing countries annually who are unprotected against IDD, by region 2000-2006	9
3	National iodine status based on urinary iodine concentrations in school aged children	9
4	Number of iodine deficient countries in 2003, 2007 and 2011	10
5	A comparison between NFHS-3 and Iodized Salt Coverage Study	12
2.	Review of literature	
1	Thyroid gland and follicle cell	24
2	Structure of thyroid hormones	24
3	Synthesis of the thyroid hormones in thyroid follicular cell	25
4	The basic deiodinase reactions	26
5	Thyroid diseases and their symptoms	27
6	Normal, over-active and under-active thyroid gland	31
7	Algorithm for the evaluation of hyperthyroidism [left] and hypothyroidism [right] during pregnancy	33
8	Changes in TSH and hCG during gestation	34
9	TBG during normal pregnancy (mean \pm 2SD) in 2-week intervals	35
10	Changes in the hypothalamus-pituitary-thyroid axis during pregnancy	37
11	Relationship between thyroid hormone action and development of the brain	41
12	The ontogeny of fetal thyroid hormone metabolism and concentrations of fetal TSH, T4 and T3 during gestation	42
13	Placental transfer of thyroid hormones	44
14	Relative changes in maternal and fetal thyroid function during pregnancy	45
15	Regulation of intracellular supplies of T3 to the nucleus of T3 target cells.	47
16	Mechanism of thyroid hormone receptor action	48
17	Interaction of maternal, placental and fetal thyroid metabolism	50
18	Delivery of thyroid hormones to neurons	54
19	Thyroid hormone transporters in the brain	56
20	Negative feedback regulation of the hypothalamic- pituitary- thyroid axis	58
21	An algorithm for systematic screening of thyroid autoimmunity and hypothyroidism during pregnancy based on the determination of thyroid antibodies (Ab)	62

Sr. No.	Title of figures	Page No.
22	Iodized salt consumption at household level in INDIA	75
23	Difference in iodized salt coverage	76
24	Comparison of difference in IS coverage [2006-09]	76
25	State level iodized salt coverage in Indian in 2009	77
26	Glimpses of production of iodized salt in India	78
27	From physiological adaptation to pathological alterations of the thyroidal economy during pregnancy	81
28	Schematic representation of the kinetics of iodide in healthy non-pregnant and pregnant adults	85
29	Left (a)- Relation between body weight and body iron content in the fetus and newborn child (de Leeuw et al, 1966) & Right (b)- Effects of iron supplementation on serum ferritin concentration in pregnancy (Fenton et al, 1977)	99
30	Estimated daily iron requirements during pregnancy in a 55-kg woman	101
3.	MATERIALS AND METHODS	
1	Measurement of length of infant	123
2	Sealing cassette	130
3	Sample of microplate for urinary iodine analysis	131
4	Stratec SR300 Automated Radio Immunoassay Analyzer	135
5	Sandwich ELIZA method	138
4.	RESULTS AND DISCUSSION	
4.1.	Phase I	
1	Nutritional status of pregnant women according to BMI	172
2	Iron Deficiency Anemia using hemoglobin	175
3	Median Urinary Iodine Excretion (mcg/L) of the population of the studies reviewed	178
4	Iodine intake of pregnant women using UI	180
5	Percentage of at risk women for developing hypothyroidism	182
4.2.	Phase II	
1	Energy intake of pregnant women according to RDA	187
2	Protein intake of pregnant women according to RDA	187
3	Visible fat intake of pregnant women according to RDA	188
4	Subjects-wise increment in BMI of pregnant women from 3 rd month to 9 th month and cumulative frequency	189
5	Correlation and regression	191
6	Box plot of haemoglobin and cumulative frequency	193
7	Trends in mean hemoglobin (g/dl)	194
8	Subject-wise prevalence of IDA	196

Sr. No.	Title of figures	Page No.
9	Frequency distribution of median urinary iodine during pregnancy	198
10	Trends in urinary iodine ($\mu\text{g/L}$)	199
11	5 th and 95 th percentile values of thyroid hormones	204
12	Box-plot and cumulative frequency of TSH	205
13	Box-plot and cumulative frequency of FT4	205
14	Box-plot and cumulative frequency of TT4	206
15	Box-plot and cumulative frequency of TG	206
16	Distribution of TSH during each trimester	208
17	Distribution of FT4 during each trimester	208
18	Mean difference in TSH during first, second and third trimester	212
19	Mean difference in FT4 during first, second and third trimester	213
20	Mean difference in TT4 during first, second and third trimester	215
21	Mean difference in TG during first, second and third trimester	216
22	Distribution of pregnant women according to trimester-specific reference interval of present study (method 1)	222
23	Distribution of pregnant women according to International guidelines (method 2) (Albanovich et al, 2007)	223
24	Distribution of pregnant women according to trimester-specific reference interval (method 3) [Marwah et al, 2007]	224
25	Correlation (regression line) between TSH and FT4 during each trimester	226
26	Correlation (regression line) between TSH and TT4 during each trimester	227
27	Correlation (regression line) between TSH and HB during each trimester	228
28	Outcome of intervention (NHE) on Knowledge and Practices of population	230
29	Frequency of consumption of iron rich cereals	231
30	Frequency of consumption of iron rich fruits	232
31	Frequency of consumption of iron rich legumes and pulses	233
32	Frequency of consumption of iron rich vegetables	234
33	Frequency of consumption of Vitamin C rich foods	235
34	Frequency of consumption of non vegetarian food items	236
35	Child care indicators	241
4.3.	Phase III	
1	Mean birth weight of male and female neonates	243
2	Mean birth weight of neonates born with normal delivery and with caesarean section	243
3	Prevalence of raised TSH among neonates	244

Sr. No.	Title of figures	Page No.
4	Correlation between CBSTH and UI during third trimester	245
5	Correlation between birth-weight and CBTSH and CBFT4 and birth-weight	246
6	Correlation between birth-weight and head circumference and length and birth-weight	247
7	Correlation between CBFT4 and FT4 during third trimester and CBTSH and TSH during third trimester	248
4.4.	Phase IV	
1	Comparison of energy, protein and fat intake of women during pregnancy and postpartum	253
2	Prevalence of IDA during pregnancy and lactation	255
3	Prevalence of ID during pregnancy and lactation	255
4	Mean HB during pregnancy and postpartum	259
5	Median UI during pregnancy and postpartum	259
6	Mean TSH during pregnancy and postpartum	260
7	Mean FT4 during pregnancy and postpartum	260
8	Mean TT4 during pregnancy and postpartum	261
9	Mean TG during pregnancy and postpartum	261
10	Median urinary iodine (UI) before (Pre) and after (Post) DFS supplementation in experimental group and control group	268
11	Mean hemoglobin before (Pre) and after (Post) DFS supplementation in experimental and control group	269
12	Mean BDSTI in group I [experimental] and Group II [control]	273
13	Association between first trimester FT4 and BDSTI at 6 months	274