Chapter - 5

Summary and Conclusion

Chapter: 5

SUMMARY AND CONCLUSION

The present study is summarized as:

5.1 General information of respondents:

The average age of respondents was 25.09 years. Maximum number of respondents (41.5%) were highly educated (under graduate or above) and minimum number respondents (26.8%) were middle educated i.e. upto senior secondary. 89.4% respondents were Hindu and rest of respondents (10.6%) were Muslims. Majority of respondents (49.2%) belonged to general caste and minimum (20.3%) belonged to SC/ST. Maximum number of respondents (57.3%) belonged to urban habitat and rest of respondents (42.7%) was the rural habitants. Respondents were majorly from joint family (83.3%). Maximum number of respondents (47.6%) was having more than 6 members in their family. Maximum number of respondents (87.4%) was house wives by their occupation. All the respondents (100.0%) were doing the sedentary activity. Maximum number of respondents (52.0%) was in the range of Rs.1547-5155 of monthly per capita income and minimum number of respondents (11.8%) had income below Rs 1546. Maximum percentage of respondents belonged to middle socio-economic status (52.0%) and least number of respondents (11.8%) were from high socio-economic status. Maximum number of respondents (72%) was from 2^{nd} trimester and only 28% respondents were from 1^{st} trimester. Multigravida was found in majority of respondents (63.8%) and primigravida was only in 36.2% respondents. Mean of height was calculated as 150.15±3.90cm in 1^{st} trimester and 151.46±4.51cm in 2^{nd} trimester. Mean of weight was calculated as 44.98±5.78 kg in 1^{st} trimester and 51.03±7.33 kg in 2^{nd} trimester. Mean

of BMI was calculated as 19.96±2.12 kg/m² in 1st trimester and 22.15±2.39 kg/m² in 2nd trimester. Maximum percentage of underweight respondents was in 1st trimester (37.7%) than 2nd trimester (9.6%), normal weight respondents were maximum in 2nd trimester (77.4%) followed by 1st trimester respondents (56.6%) and overweight respondents were more in 2nd trimester (13.0%) and very few in 1st trimester (5.8%).

5.2 Dietary Practices of respondents:

Various studies indicate that diet of pregnant ladies in India are generally deficient, esp. so in the rural areas and in the urban lower class (Gupta RK. Towards better nutrition of pregnant women in the developing world. Indian J of PSM). These two groups form a major proportion of our society. In the present study, urban area was found to be in better position than the rural area. In urban area, eating 3 times was prevalent among respondents (41.1%) but in rural area, respondents (36.2%) used to eat only 2 times. According to socio-economic status, with nutritional point of view, respondents of high socio-economic status was much better than middle socio-economic status. Low socio-economic group were most nutrient deficient group. In high socio-economic status, eating 4 times was reported by majority (48.3%) of respondents whereas in middle socio-economic status, eating 3 times was majorly (39.8%) found. The diet is mainly a cereal based diet supplemented with pulses and vegetables. Maximum percentage of respondents of rural (79.0%) and urban (61.0%) habitat as well as in middle (63.3%) and low (85.4%) socioeconomic status was non-vegetarian.

As far as food consumption was concerned, urban and high social class women enjoyed a better position in all the food items. It was observed that cereal and pulses were consumed by approximately all the respondents (99.2%) on a daily basis. Consumption of green leafy vegetables was mainly on weekly basis in both rural (57.1%) and urban

(70.9%) habitats as well as in high (62.1%) and middle (82.0%) socio-economic status. Low socio-economic respondents were majorly (58.8%) taking it occasionally. Roots and tuber was consumed majorly on daily basis in rural (56.2%) and urban (61.0%) habitats and also in high (96.6%), middle (60.2%) and low (44.9%) socio-economic classes. Other vegetables were found to be occasionally included by respondents of rural (68.6%) and urban (83.0%) habitat as well as by the respondents of high (75.9%), middle (81.2%) and low (70.8%) socio-economic status. Fruits were majorly eaten on a weekly basis in urban area (50.4%), high (79.3%) and middle (47.7%) socio-economic classes whereas in rural area (64.8%) and low socioeconomic status (69.7%), it was majorly consumed occasionally. Milk is used only to prepare tea mainly in low socioeconomic status and rural area. Milk was consumed majorly on a daily basis in urban area (38.3%) and high (65.5%) socio-economic status whereas majority of respondents of rural (67.6%), middle (39.8%) and low (74.2%) socio-economic status were drinking milk occasionally. Of the foods of animal origin, Intake in rural (90.4%), urban (87.2) habitat and high (33.3%), middle (9.9%) and low (9.2%) socioeconomic status was observed maximum on an occasional basis. Sugar and jaggery was also consumed by them on a daily basis (95.5%). In the habitats, it was found that maximum number of respondents of rural (47.6%) and urban (73.0%) habitat was using the saturated fats occasionally. Unsaturated fats were in majority used on a daily basis in rural (64.8%) and urban (78.7%) habitat. The use of saturated fats was found maximum on an occasional basis in high (93.1%), middle (66.4%) as well as low (46.1%) socio-economic status. The consumption of unsaturated fats was found majorly on a daily basis in high (79.3%), middle (83.6%) as well as low (55.1%) socio-economic status. Many a times only a chilly - salt mixture or onion is eaten with rice or chapati, with no pulses, vegetables, fat or fruits.

When the fibre intake of respondents was analyzed, it was observed that maximum number of respondents (59.0) from rural habitat was including wheat bran whereas maximum number of respondents (53.2%) from urban habitat was not including the wheat bran. Maximum consumption of wheat bran in high and low socio-economic status was observed as 69.0% and 57.3% respectively. Consumption pattern of salad was found maximum occasionally in rural area (55.2%) but urban respondents (42.6%) majorly consumed salad on a weekly basis. Maximum consumption of salad in high socio-economic status (55.2%) was observed on a daily basis, in respondents of middle socio-economic (60.2%) status on weekly basis.

As far as food avoidance was concerned, there was more avoidance found in rural area for tea (29.5%), coffee (71.4%), cold drinks (58.1%) than the respective in urban area but chocholates (38.3%) was more avoided in urban area. The avoidance of coffee, cold drink and chocholates was significant in rural and urban area. According to socio-economic status, tea (55.2%), coffee (55.2%), cold drink (72.4%) and chocholates (62.1%) were majorly avoided in high socio-economic status and found significant. Alcohol, papaya, raw or undercooked milk and raw or undercooked flesh food were totally avoided by all the respondents of both rural and urban habitats as well as in all socio-economic status. Raw or undercooked egg was majorly avoided in rural area (45.8%) and low socio-economic status (58.3%).

Many times they also chose to eat outside in restaurant or street food. Majority of rural respondents (87.6%) were eating street food whereas urban respondents (40.4%) were majorly eating fast food at restaurant. According to socio-economic status, majority of respondents (48.3%) of high social class chose to eat regular meal at restaurant and

majority of respondents of middle (45.3%) and low (96.6%) socio-economic status generally had chosen street food.

The food misconceptions and beliefs were also common among respondents. Misconception about eating in large amount will give larger baby was the belief which in majority followed by 17.1% respondents of the total rural respondents but the belief about including cold food item which in majority followed by 9.2% respondents of total urban respondents.

In the present study, there was found lack of appetite (78.3%) and food aversion (68.1%) majorly in the 1st trimester of pregnancy. In the 2nd trimester, there was found increase in appetite in majority of respondents (59.9%) but still not consuming the food upto the level of recommendation. The food aversion was found mainly for fried and fatty food, spicy food, sweet products, cooked pulses, milk, flesh food and egg products. The maximum aversion found in 1st trimester for vegetarian food i.e. fried and fatty food (30.4%) and in non-vegetarian food i.e. chicken/mutton/fish (37.8%). There was also found cravings for food and it was more found in 1st trimester (46.4%) than the 2nd trimester (35.0%) of pregnancy. A maximum craving was found for sour or tart food in the 1st trimester (24.6%) followed by salty food in the 2nd trimester (20.3%). Based on pica practices of respondents, it was practiced by very fewer numbers of respondents and majorly found in 1st trimester (11.6%). The most frequently practiced pica substances were soft stone, soil, ash, soap, clay.

5.3 Nutrient adequacy of respondents:

It was found that the mean nutrient intake of the respondent was significantly less as compared to RDA.

The mean nutrient adequacy ratio when recorded according to their gestational period, it was observed that maximum respondents of 1st trimester (85.5%) was found to be having calorie adequacy ratio in the range of 50-75% whereas in the 2nd trimester, maximum respondents (75.1%) were in the range of 75-100% adequacy. Maximum protein adequacy was found in range below 50% in 1st trimester whereas 50-75% in 2nd trimester. Fat adequacy ratio was found above 100.0% in approximately all the respondents of both the trimesters. Below 50% adequacy of iron, calcium and folic acid was found in 94.2%, 100% and 84.1% respondents of 1st trimester and also below 50% adequacy for calcium and folic acid was found in 68.9% and 76.3% respondents of 2nd trimester. The intake of calorie (1501.74±179.48 kcal), protein (39.43 ± 4.82 gm), iron (15.26 ±1.38mg), calcium (436.75 ± 58.30 mg) and folic acid (177.34 ± 8.39 µg) was found to be higher in 2nd trimester than the intake of calorie (1814.71±206.39 kcal), protein (46.55 ± 5.80 gm), iron (17.49 ±1.92 mg), calcium (552.32 ±118.05 mg) and folic acid (200.54 ± 21.55 µg) in 1st trimester. Fat intake remained constant in both 1st (35.91 ±2.55 gm) and 2nd (35.91 ±3.29 gm) trimester.

When mean nutrient adequacy ratio was analyzed against the rural-urban habitat, it was evident that maximum respondents (56.2%) of rural habitat were having calorie adequacy ratio between 50-75% but in urban area, maximum 69.5% respondents was found between 75-100% calorie adequacy ratio. Protein adequacy ratio upto 50-75% of RDA was observed in majority of respondents (81.6%) of urban habitants. Below 50% adequacy of iron, calcium and folic acid was found in 85.7%, 97.1% and 100.0%

respondents of rural habitat respectively. Below 50% adequacy of calcium and folic acid was found in 63.1% and 95.5% respondents of urban habitat respectively but iron intake was found between 50-75% in majority of urban respondents (55.3%). In urban habitat, the intake of calorie (1812.50±223.15 kcal), protein (46.82 ± 6.49 gm), iron (17.62 ±2.06 mg), calcium (566.62 ±123.04 mg) and folic acid (200.85 ± 24.00 µg) was found to be higher than the intake of calorie (1612.01±222.75 kcal), protein (41.51 ± 4.84 gm), iron (15.84 ±1.51mg), calcium (457.17 ± 69.78 mg) and folic acid (184.87 ± 12.88 µg) in rural habitat. Fat intake was found high in rural (36.96 ±2.75gm) than urban (35.13 ±3.12 gm) habitat.

When the comparison was made between mean nutrient adequacy ratio and socioeconomic status, it was observed that majority of respondents of high (86.2%) and middle (66.4%) socioeconomic status were showing the calorie adequacy ratio between 75-100%. Maximum respondents of high (93.1%), middle (81.2%) and low (53.9%) socio-economic status were having protein adequacy ratio in the range of 50-75%. Fat intake was found to be more than recommended level in 100% respondents all socio-economic groups except the high socio-economic status. Below 50% of adequacy ratio of Iron, calcium and folic acid was observed in maximum number of respondents of low socio-economic status (91.0% for iron, 98.9% for calcium and 100.0% for folic acid adequacy ratios). It was observed that the intake of calorie, protein, iron, calcium and folic acid was found maximum in high socio-economic status (1944.21±160.40 kcal, 51.57±5.67 gm, 19.15±1.54 mg, 642.69±95.35 mg and 221.73±21.19 µg respectively), minimum in low socio-economic status (1575.54±223.52 kcal, 40.95±4.74 gm, 15.49±1.43 mg, 447.70±66.31 mg and 181.93±9.78 µg respectively). Fat intake was

noted to be maximum in low socio-economic status (37.47±2.59 gm) and minimum in high socio-economic status (34.20±3.50 gm).

When mean nutrient adequacy ratio was analyzed against the age of respondents, it was observed that, in both age groups, majority of respondents (58.4% in 25-34 years) and (54.6% in 19-24 years) were showing the calorie adequacy ratio between 75-100%. Majority of respondents of both the age groups (73.2% in 19-24 years and 72.5% in 25-34 years) were found to have the protein adequacy ratio in the range of 50-75%. Fat adequacy ratio was found above 100.0% in approximately all the respondents of both the age groups (100.0% in 19-24 years and 98.7% in 25-34 years). Iron, calcium and folic acid adequacy ratio was found below 50% in maximum number of respondents of both the age groups. Iron adequacy ratio (69.1% and 57.7% in 19-24 years and 25-34 years respectively), Calcium adequacy ratio (85.6% and 72.5% in 19-24 years and 25-34 years respectively) and folic acid adequacy ratio (96.9% and 97.3% in 19-24 years and 25-34 years respectively). It was observed that the mean nutrient intake was found approximately equal in the age group 19-24 years (calorie: 1705.84±226.41 kcal, protein: 43.49 ± 5.48 gm, fat: 36.38 ±2.98 gm, iron: 16.74 ±1.89 mg, calcium: 495.43 ± 88.57 mg and folic acid: 189.12 ± 17.53 µg) and the age group 25-34 years (calorie: 1740.66±254.13 kcal, protein: 45.24 ± 6.86 mg, fat: 35.61 ±3.15 gm, iron: 16.94 ±2.14 mg, calcium: 535.83 ±129.91 mg and folic acid: 197.23 ± 23.23 µg).

When the respondents were registered, mean nutrient adequacy ratio was calculated against the body mass index, it was found that the respondents who were normal (65.9%) and overweight (88.9%) were observed to be having calorie adequacy maximum in the range of 75-100% of RDA. 50-75% of adequacy was found maximum in the underweight respondents (90.7%). Below 50% of protein adequacy was observed

in the maximum number of underweight respondents (83.7%). The respondents who were normal (83.5%) and overweight (92.6%) were observed to be having protein adequacy maximum in the range of 50-75% of RDA. Only 7.4% of overweight respondents were having 75-100% adequacy. Fat adequacy ratio was found above the adequacy level (>100%) in 100.0% of respondents. 100.0% respondents of underweight BMI were having below 50% of iron and calcium adequacy and 97.7% respondents of underweight BMI were observed to be having below 50% of folic acid adequacy. Below 50% of adequacy of iron, calcium and folic acid was found in 58.0%, 76.1% and 97.7% respondents of normal BMI respectively. In overweight respondents, majorly 70.4% respondents were having iron adequacy between 50-75% of recommended level while 50% adequacy of folic acid was observed in majorly 92.6% respondents. It was observed that the intake of calorie, protein, iron, calcium and folic acid was found maximum in overweight respondents (1925.07±146.62 kcal, 49.91±5.81 gm, 18.40±1.78 mg, 608.14±115.49 mg and 211.61±22.91 µg respectively), minimum in underweight respondents (1362.49±154.98 kcal, 37.39±4.20 gm, 14.51±1.08 mg, 403.48±51.56 mg and 175.43±10.73 µg respectively). Fat intake was noted to be maximum in underweight respondents (36.99±2.49 gm) and minimum in overweight respondents (35.24±2.43 gm).

5.4 Effect of counselling on the mean nutrient intake of respondents:

The mean nutrient intake after counseling more closely approximated the RDA in 2nd follow up than 1st follow up although the mean nutrient intake in both follow ups was below recommended intake. Initially, Calorie, protein, fat, calcium and folic acid reached the level of adequacy of 76.7 %, 54.19 %, 119.7 %, 48.17 %, 43.32 % and 38.80 % respectively. Fat intake was observed more than the level of adequacy. In 1st follow

up, calorie, protein, fat, calcium and folic acid increased and reached the level of adequacy of 80.22%, 59.08 %, 120.23 %, 59.65 %, 50.34 % and 42.72 % respectively. In the 2nd follow up, maximum nutrient adequacy achieved by the respondents was described as 86.33 %, 64.40 %, 119.93 %, 71.68 %, 66.76 % and 64.00 % for calorie, protein, fat, calcium and folic acid respectively. Fat intake remained high and more than the adequacy level in 1st and 2nd follow up also.

In the Initial study, 44.98±5.78 kg and 45.53±4.38 kg of mean weight were calculated in the respondents of 1st trimester and 2nd trimester respectively. In the 1st follow up, 45.53±4.38 kg weight was calculated in the respondents of 1st trimester whereas in the 2nd trimester, the total mean weight of respondents was found to be 51.63±7.44 kg. In the 2nd follow up, because more respondents jumped into the 3rd trimester than those who entered the 2nd trimester, therefore mean weight somehow decreased slightly in the 2nd trimester respondents (51.16±6.72 kg) during the 2nd follow up. There was increase in the mean weight (56.10±7.46 kg) was found in respondents who just entered the 3rd trimester.

5.5 Following conclusions were drawn from the above investigation:

Usually only two main meals were taken in both habitats and all socio-economic classes. The nutrient value of such a diet is grossly limited even for a non-pregnant woman. This inadequate diet is not only limited in calories, but is poor in proteins and micronutrients as well. The pregnant woman becomes malnourished. She is more prone to post-partum haemorrhage and death. This anaemic and malnourished woman delivers a physically and/or mentally retarded neonate. There may be bone deformities, mental deficiencies and due to low immunity and nutritional reserves such a child would be more prone to infections and malnutrition. In case it was a girl child, she grows into a

nutritionally deficient teenaged girl and mother. The cycle continues and so perpetuates the malnutrition cycle. It is therefore important to offer and consume a balanced diet. The diet should be so modified that more of the protective foods (vitamins and minerals) and body building foods (proteins) are included rather than only excess of energy.

There were various reasons behind the lower mean nutrient intake. The most important was socio-economic status and their education. In spite of better education and highly monthly income of respondents who belonged to high social status, mean nutrient intake was lower than RDA. The fat intake was found high and approximately same during the overall study process as they were including fast food and street food in their diet and were preparing daily meal by using oil more than the recommended amount. This might have been due to poor knowledge on nutrition and ignorance about being healthy by these women. The agriculture extension and home science extension workers should encourage the rural women to cultivate more fruits, vegetables etc, and popularize the same for consumption in the rural families. During pregnancy, the problem of lack of appetite, food aversion was very common which may also lead to low nutrient intake. Hence we need to emphasize health awareness sessions in the community. Therefore we feel that proper health educational program should be launched to address these issues appropriately once we have identified our local socio-cultural beliefs and practices. However this can be promoted by improving nutritional knowledge and dietary practices of population in general and vulnerable groups in particular through media and maternal and child health services. The involvement and training of existing traditional health practitioners would also encourage the people to change their health behavior and to avoid unnecessary food restrictions which would be particularly useful in improving maternal and child health.