SUMMARY AND CONCLUSION
Chapter – V

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India has made a slow and steady progress in human development ever since independence. Severe and florid forms of malnutrition have declined substantially, infant mortality has declined from 146 per 1000 live births (1951) to 69 per 1000 live births (2001) and life expectancy has risen from 37 years to 63 years, not to mention our achievement of self sufficiency in food production. In spite of all these impressive developments on records, one third of newborns start their life with low birth weight, more than half of young children below five years of age continue to suffer from moderate and severe malnutrition, over 60% of women are anaemic and this figure rises to 85% during pregnancy stage and 40-60% of adolescent girls tend to be anaemic. Malnutrition is thus widespread in rural, tribal and urban slum areas and it is a significant public health problem described as silent killer, silent emergency, invisible enemy affecting those who cannot express, their voice and have to depend upon others for their advocacy (Government of India, 2004).

All the supplementary nutrition programmes initiated nationwide by many states and continued for decades have succeeded marginally to improve the nutritional status of the target group (young children and pregnant women). Lots of resources have been wasted on this front, as these programmes were pursued in isolation, creating dependency. The emphasis remained on distribution and not much was invested on nutrition education. Similarly, supplementing specific nutrients like iron and folic acid tablets have not produced much result to decrease anaemia in pregnant woman.
The study was conducted in Medical College and Sree Uthradom Thirunal hospital Thiruvananthapuram. Survey method was selected to identify pregnant samples between the age group of 20 to 40 years in the first trimester of pregnancy. In the first phase, anaemic and non-anaemic sample were located in the main sample. Among the 1000 sample group, 453 pregnant women were anaemic and 547 pregnant women were non-anaemic in first trimester of pregnancy. In the second phase out of the 453 anaemic pregnant women, 250 sub samples were selected by purposive random sampling for intensive study. In addition, a third phase of study was mainly done to find out the significance of the nutritional awareness programme on outcome of pregnancy. The 250 sub samples were categorised into 125 experimental and 125 control groups by random sampling.

For the main sample, the tools used for the study consisted of a questionnaire along with schedule consisting of anthropometric details of pregnant women and the babies born to them. In the case of the sub sample, the schedule consisted of dietary data of 24-hour recall of three consecutive days, biochemical analysis of blood in each trimester, stool analysis and clinical examination. Using an attitude scale nutritional awareness was recorded for planning a nutrition education programme. Nutritional awareness session was taken for the experimental group and a booklet in regional language was given as hand out.

The findings of the study in each phase are elicited below.

Phase I
The socio-economic pattern of the main sample revealed more representation of samples between 20 yrs to 30 yrs and most of the pregnancies were between the ages of 26 to 30 yrs. Most of the sample lived in nuclear families.
Among the sample 96.5% were educated. The sample had more representation based on income from the lower middle class followed by the upper middle class. In most of the sample only one member was working. The sample represented more Hindus, followed by Christians and Muslims. Dietary habits of data revealed that most of the samples were non-vegetarians. 48% of the samples were in first order of pregnancy followed by 43.4% in the second order. The first delivery was between the age of 21 to 30 years for 47.8% and for 40% the age was between 26 to 30 years. The first delivery was normal for 52.1% and caesarean for 47.9%. Total number of pregnancies for 42% was two, and for 40% it was only one. Abortion and miscarriage was a complication in previous pregnancy of 14.5% of the sample. Anaemia was a major disorder in 16% of the sample in previous pregnancy. Mild anaemia was seen in 28.7% and 16.6% were with moderate anaemia.

In the sample, 18.3% were with weight below 45kg in first trimester and 10.8% in third trimester. 49.8% of the sample had weight gain of 11 kg to 15kg. Further, 11% of the main sample had low birth weight babies. The babies born were with length between 45 to 49 cm in 55.6% of the sample. Colostrum was fed to newborn in 76% of the cases. In combination diet, 32.9% had cereal, pulse and tea, for breakfast. In the case of lunch, 31.2% had cereal, pulse, a vegetarian side dish and fruit. Evening teatime combination for 56.5% of the sample was cereal and tea. Dinner time combination showed mixed trend, 26.5% had cereal and non-vegetarian diet.

**Phase II**

The cyanmethaemoglobin analysis showed that 45.3% of the sample was anaemic and 54.7% were non-anaemic. The anaemic sample in 20 to 25 yrs age group was 41.9% while 38.4% were non-anaemic. Anaemic sample
above 31 years were 15% and in the non-anaemic it was 17.6%. Among the anaemic sample only 2.7% were illiterate. As the educational status increased, cases of anaemia decreased in high-income and low-income anaemic groups. Professionally educated high-income group were more in numbers in non-anaemic group compared to anaemic group. The complication prevalent in previous pregnancy of anaemic middle school educated samples was more miscarriage and in the high school educated, it was abortion. The non-anaemic sample had comparatively fewer cases of complication in previous pregnancy. The anaemic group was mostly living in nuclear family while the non-anaemic were mostly living in joint families. Both the group had more samples with income above Rs.1500. Non vegetarians were common in both groups. The religious status showed more Hindus in both groups followed by Christian and Muslims. Anaemic and non-anaemic sample were mostly in first order of pregnancy. Anaemic sample had more cases of abortion and miscarriages in previous pregnancy while the non-anaemic, had comparatively higher number of stillbirths. Anaemia was a major disorder in previous pregnancy of anaemic sample while non-anaemic had blood pressure, diabetes and oedema. The disorders in previous pregnancy decreased as the educational level of the spouse increased in both the groups. Anaemia in previous pregnancy decreased as the educational status of the spouse increased. Anaemic sample (20.8%) were underweight in first trimester compared to the non-anaemic sample (7.3%). In third trimester 14.3% of anaemic samples were underweight compared to 7.9% of non-anaemic sample. Anaemic sample had 9.2% of sample with weight gain below 5kg in pregnancy compared to 1.8 % of the non-anaemic mainly they were mostly underweight at the onset of pregnancy (Table 2.10 a). There was slow weight gain from first trimester to third trimester in anaemic case; however, a steady pace of weight gain was seen among non-anaemic sample. The special food taken by the anaemic sample apart from the normal diet during pregnancy was mainly fruits; however, the
non-anaemic sample took vegetables. The reasons for taking special food in both the groups were for better growth of baby. In food items, both the group avoided papaya, as it induced abortion. Low birth weight babies were born to the moderately anaemic (14.4%) and mildly anaemic mothers (10.8%). However, only 10% of the non-anaemic had low birth weight babies. In the anaemic sample, overall, 12.1% had low birth weight babies and in non-anaemic 10.1%. Christian anaemic sample had more low birth weight babies (12.6%) than Muslims (12.5) and Hindus (12%). In non-anaemic sample, Muslims (11.7%) had more low birth weight babies than Christians (10.8%) and Hindus (9.5%). As the spouse education decreased, more low birth weight babies were born in anaemic sample. In non-anaemic sample, low birth weight babies were born mostly, in the case of middle school level educated spouse. Both the sample had mostly cereals, pulses and tea combinations for breakfast; cereal and vegetarian combination for lunch and for teatime, cereal and tea was taken. The dinner combination was mostly cereal, non-vegetarian curry and fruits for anaemic sample, while the non-anaemic sample had cereal and non-vegetarian curry.

It was mainly noticed that

- a) As the age of the sample increased chances of maternal anaemia was lower.
- b) Better education status of the sample and spouse lower the chance of maternal anaemia.
- c) Disorders in previous pregnancy lead to reoccurrences in subsequent pregnancy.
- d) Mainly moderate and mild anaemia cases were observed in the sample. None of the sample was severely anaemic.
- e) No case of hookworm infestation was observed.
- f) Maternal anaemia leads to low birth weight babies.
g) Cereal based diet was predominant among anaemic sample.

h) Nutritional awareness was low among anaemic sample.

Phase III
This phase of the study was done to find out the significance of nutrition awareness programme on outcome of pregnancy. The experimental and control group had similar representation among age group, educational and income status. Majority of sample, in both the groups were non-vegetarians. Experimental and control group mostly lived in nuclear families, and were predominantly in first order of pregnancy. The main findings are listed below:

a) Abortion cases were seen mainly in samples with age above 30 years in both the groups. It was predominant disorder in previous pregnancy in both groups.

b) First order of pregnancy had 6.3% of abortion while third order had 38.5% abortion cases in previous pregnancies of the experimental group. Control group showed 9.6% of abortion in first order and 46.7% in third order.

c) Blood pressure was largely normal in both the groups.

d) The mean calorie intake of experimental group was 1790 Kcals and of the control group it was 1761 Kcals. The mean protein intake was 51.68 gms and 52.79 gms respectively. In the case of iron, the mean intake was 10.41 mg for the experimental group and 10.47 mg for control group. While mean intake of calcium was 274.38 mg and for control group it was 295.22 mg. Mean intake of carotene per day was 850.69 mg for the experimental and for the control group it was 1105.06 mg. Among the experimental group, mean intake of vitamin C per day was 40.88 mg and in the case of the control group it was 49.33 mg. Mean intake of vitamin C per day was 40.88 mg and in case of the control group it was 49.33 mg.
e) Experimental group and the control group consumed all food items. Special items taken by the experimental group (39%), and the control group (31.2%) specifically were vegetables during pregnancy. Reason for taking special foods by the both the groups were because of elders’ advice (60%) and doctors’ advice (56.7%) respectively.

f) 33.3% of the experimental group and 66.7% by the control group avoided papaya and pineapple. The reason given by them was that it induced abortion.

g) In the experimental group because of the awareness session, took medical supplements, while 1.6% of control group did not take them.

h) In the experimental group, 22.4% were under weight in first trimester while in third trimester only 3.2% were underweight. Control group had 17.6% underweight in first trimester and 1.6% in third trimester.

i) Nutritional awareness of the experimental sample was higher than that of the control group because of the nutritional awareness classes taken to them during pregnancy.

j) No case of hookworm infestation was observed.

k) The anaemic status marked a steady decrease by the third trimester in the experimental group from 100% anaemia cases to only 10.4% anaemic cases. While in the control group the change was from 100% anaemic cases to 69.9% anaemic cases by third trimester. The only extra intervention was session on nutritional awareness for the experimental group.

l) In the first trimester, 24% of the experimental group and 20% of the control group had low BMI. However, in third trimester, 4% of the experimental group and 1.6% of the control group had low BMI.

m) As apart from hospital ante natal check-ups, nutritional awareness was given to the experimental group; low birth weight babies born to the experimental group were only 9.6%. Whereas in the control group, as no
special awareness was given apart from usual hospital check-ups and supplementation, low birth weight babies born were 18.4%.

Main Achievement of the study

The experimental group had 100% anaemia in first trimester. The group was given nutritional awareness and informational booklet apart from medical supplementation given by doctor. By third trimester only 10.4% of the experimental group were anaemic. The control group was 100% anaemic in first trimester and was given the medical supplementation and doctors monitoring during health check up and by third trimester 69.9 % still had anaemic status. The percentage of low birth weight babies born to experimental group was comparatively lower than the control group.

Nutritional awareness and medical supplementation together has worked positively in bring about change in outcome of pregnancy in the case of maternal anaemia. The study shows that an intensive nutritional awareness along with medical supplementation can buy better results. Best nutrition experts are in the community, (the mothers, the parents and the women). We have to empower their nutritional awareness to fill the gap between knowledge and practice for wider application of community based actions for better nutrition. Hence, we envisage healthier generations for tomorrow.

Recommendations

1. A comparative study based on rural and urban anaemic pregnant women and outcome of pregnancy can be taken up.