CHAPTER 5

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

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5.1 Summary of the study

Anaemia in pregnancy is one of the major health problems in developing countries, with anaemia being directly responsible for at least 20 percent of maternal deaths. Socio-cultural and economic factors are the twin causative agents, which often go together in the background and are catalytic in precipitating in the nutritional and medical factor in the development of malnutrition. There are also many predisposing factors leading to anaemia during pregnancy such as malnutrition, frequent diarrhoea, too close deliveries, multiparity, teenage pregnancies elderly primi, increased foetal demand and pregnancy with fibroid growth. Anaemia is caused by low food intake, decreased iron rich foods in the diet, poor absorption of iron, faulty food habits, worm infestation and blood loss. The signs and symptoms of anaemia are pallor of the skin, pale conjunctiva, fatigue, shortness of breath, lack of appetite, tiredness, dizziness, weakness and pain in the legs. Anaemia is a major complication of pregnancy and is believed to be a contributing factor in the increased incidence of genitourinary infections, still births and premature births. There are some basic approaches to the prevention of anaemia such as supplementation with medication, adequate diet and dietary modification, control of infection, regular follow up and education. The most appropriate way to prevent and manage anaemia during pregnancy is health education. The present study was undertaken to assess the knowledge and practices of antenatal mothers regarding prevention and management of anaemia during pregnancy.

The objectives of the study were:

1. To find out the awareness of antenatal mothers with regard to prevention and management of anaemia during pregnancy before and after planned health education. Some of the selected areas of prevention and management of anaemia during pregnancy were:
   - Meaning of anaemia.
- Haemoglobin and its importance.
- Investigation to detect anaemia.
- Pre-disposing factors.
- Causes of anaemia.
- Early and late symptoms.
- Early and late signs.
- Complications, maternal and foetal.
- Preventive measures.
- Supplementary drugs.
- Dietary modification.
- Food hygiene.
- Cooking knowledge.
- Health habits.
- Deworming.
- Curative measures.

2. To compare the practices adopted for prevention and management of anaemia in antenatal mothers during pregnancy, before and after health education on selected areas:
   - Identify signs of anaemia.
   - Recognize preventive measures.
   - Consumption of supplementary drugs.
   - Dietary practices.
   - Food hygiene.
   - Deworming.
   - Curative treatment.

3. To find out the relation of selected variables in relation to prevention and management of anaemia during pregnancy; age, education, occupation, income, parity, gestational age, anthropometric measurement (weight only), birth weight of neonate and haemoglobin status of mother during antenatal and postnatal period.
The study was carried out in the antenatal clinic at the J.J. Group of Hospitals, Mumbai. It was a descriptive, explorative and evaluative study. The sample size was three hundred and forty; these were divided into two groups: 170 samples in the study group and 170 samples in the control group.

The samples were selected as per criteria. According to the objectives of the study, a tool was constructed. The tool included a questionnaire, physical examination, health education plan and teaching aids. The data collection was done in the following manner: before health education data was collected from the study group by using a structured interview schedule and then health education was provided on the prevention and management of anaemia during pregnancy. This health education was only given to study group. Finally, physical examination was done only in selected areas. In the same way data was collected from the control group but health education was not provided. In the next antenatal visit of both the groups data was collected using a structured interview schedule and physical examination was also done. The entire tool and health teaching plan for the study was prepared after review of literature, suggestions from social workers, and experts in nursing, medical and educational fields. The tools were tested for its content validity and reliability before commencing the pilot study.

The pilot study was undertaken on ten pregnant women from the control group and ten women from the study group. The pilot study established feasibility and practicability of the tools and technique. It was carried out in November 1999 at the J.J. Group of Hospitals. The data collection process was carried out from 2nd May 2000 to 31st December 2000 in the antenatal clinic and post natal ward at the J.J. Group of Hospitals, Mumbai. The data obtained was analysed according to the objectives of the study and presented in the form of tables and graphs.

Frequency, percentages, mean, standard deviation and mean differences were used to find out the performance of the groups, their variations from each other, and before and after the health education in the study group, and between the first and second visits in the control group. The 'Z' test was used to find out significant differences between the study and control groups variables, as well as to find out
significant differences between selected variables and characteristics of study group before and after health education.

5.2 Findings of the study

The demographic data and source of information regarding prevention and management of anaemia during pregnancy in study and control group are presented in the appendix no.9 (Table 9.1 9.XIII).

SECTION 1A

Assessment of antenatal weight and gestational age:

Out of the total 170 samples in the study group the mean weight gain was 481.57gms and SD was 184.18. It was clearly seen that if health education is given in the early weeks of gestation the average weight gain is more as in comparison to late gestational age. The control group also consisted of a total of 170 samples and their mean weight gain was 310.0gms and SD was 107.98. It was clearly seen that compared to the study group the weight gain was much less, this may be due to the fact that the control group had not received any health education on prevention and management of anaemia during pregnancy.

SECTION 1B

Haemoglobin level during antenatal period:

1B.1 Average haemoglobin status before health education in the both groups

Before health education, both the study and control groups had similar haemoglobin status. In study group it was 9.63 ± 0.64. P value was significant (0.0008).

1B.11 Comparison of haemoglobin status in the study group after health education and on the second clinical visit in the control group

Haemoglobin status in study group after health education was 11.11 and 0.53 mean and SD respectively and 10.15 and 0.74 respectively in the control group. 't' value was 13.909 and p value was significant (0.000).
1 B.III Percentage increase in haemoglobin status after health education in the study group and on the second visit in the control group

It was revealed that the haemoglobin status in the study group mean was 9.63 before health education and 11.11 after health education where as in the control group mean was 9.44 in the first clinical visit and 10.15 in the second clinical visit. The ‘t’ value for study group was 29.936 where as it was 20.429 in the control group. Study group has shown significantly high percentage improvement, while in the control group the percentage increase in haemoglobin status was less.

SECTION 1C

Post-natal haemoglobin status

The post-natal haemoglobin value in the study group mean ± SD was 11.51 ± 0.58 and in the control group it was 10.37 ± 0.57. This clearly showed that haemoglobin status was within normal range in the study group.

SECTION 1D

Consumption of deworming agents

Ninety three point five percent of mothers in the study group received and 92.6 percent consumed deworming agents where as 90.6 percent of mothers in the control group received deworming agents but only 90.6 percent mothers had consumed deworming agents.

The chi-square value was 1.006 and the p-value was 0.316 hence consumption and receiving of deworming agents was not significant.

SECTION 1E

One hundred fifty eight percent of samples in the study group had infants whose mean birth weight was 2943.7 gms. and SD 157 and 152 percent of samples in the control group had infants whose mean birth weight was 2620.7 gms. and SD of 246.4. The ‘t’ value was 13.819 and p-value was 0.000 hence increase in the mean birth weight in both the groups is significant.
1 B.11: **Percentage increase in haemoglobin status after health education in the study group and on the second visit in the control group**

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SECTION 2

Assessment of antenatal mothers' knowledge about prevention and management of anaemia during pregnancy on selected components

2.1 Meaning of anaemia

Eight point two percent of mothers had awareness about anaemia before health education whereas it was increased to 98 percent after health education, in the study group, and in the control group 77.1 percent awareness about anaemia on the second visit. Majority of the mothers from the study group responded as to the meaning of anaemia after health education; according to 94 percent it was less blood found in the body, 91 percent replied that levels of haemoglobin lower than normal and 78 percent stated that it was a loss of red blood cells in the blood. But in the control group the replies as to the meaning of anaemia were 46.5 percent, 31.2 percent and 12.4 percent respectively.

2.1.1 Haemoglobin and its importance

After health education in the study group knowledge increased in relation to haemoglobin and its importance: 97 percent replied that it carried oxygen to each cell of the body, 95 percent said it keeps the organs active for normal function and 94 percent replied that it provides nutrients to each cell of the body. But in the control group only 51.8 percent replied that it carried oxygen to each cell of the body, on first visit only 5.3 percent responses were observed in relation to provide nutrients to each cell of the body and it remained same on the second visit also (5.3%). There was 89.4 percent responses observed in relation to keep the organs active for normal functions in the control group. It was clearly seen that the study group’s responses were more than control group’s; because study group had received health education. Only the data from control group was gathered at both times.

Significance level - There was a high (p<0.01) significance in all the sub areas in both, study and control groups.
2.III Pre-disposing factors of anaemia

Majority of responses regarding pre-disposing factors of anaemia increased after health education in the study group. Ninety seven point six percent responded for malnutrition, 97.6 percent to close deliveries, 97.6 percent for multiparity, 97.6 percent for teenage pregnancies, 97.6 percent for elderly primi, 95.3 percent for frequent diarrhoea, 94.7 percent for increased foetal demand and 81.8 percent for pregnancy with fibroid growth. But in the control group, 94.1 percent responded for malnutrition and in the other areas it was 90.94 percent increase in knowledge.

Significance level - There was a high significance (p< 0.01) after health education in the study group and on the second visit in the control group.

2.IV Causes of anaemia

Majority of the mothers had knowledge about the causes of anaemia during pregnancy. It was increased after health education. Ninety seven point six percent said low food intake in the study group where as in the control group it was 95.9 percent. It was a common cause because all the women knew about it. But other causes such as 97.6 percent worm infestations and 97.6 percent blood loss were seen in the study group. In the control group only 22.9 percent and 24.7 percent responses were seen in these areas.

Significance level - There was a high (p<0.01) significance in all the areas after health education in the study group and on the second visit in the control group, except for the cause due to infection where it was not significant (p>0.05).

2.VA Physical examination findings in relation to symptoms

Awareness about symptoms of anaemia - After health education 95.9 percent of mothers in the study group and on the second visit 84.1 percent in the control group had awareness regarding symptoms of anaemia.

Physical examination findings - Majority of the responses improved after health education in the study group; 98.82 percent replied mild weakness, 98.33 percent mild pain in the legs, 98.3 percent mild loss of appetite, 98.2 percent mild lethargy, 97.1 percent mild dizziness and 85.3 percent mild fatigue. Whereas in the control group the responses were; 90 percent moderate weakness, 89.4 percent dizziness, 99 percent mild headache, 58.8 percent tiredness, 95.3 percent breathlessness, and 96.5 percent replied lethargy and fatigue.
Significance level - There was a significant relationship between the two groups, except for breathlessness.

2.VB Physical examination findings in relation to signs

After health education physical examination findings on selected areas were improved in the study group; 92 percent replied nails were pink, 91.17 percent bright red conjunctiva and 88.3 percent bright red tongue whereas in the control group; 82.9 percent replied mild pink nails and 62.4 percent bright red conjunctiva.

Significance level - There was a significant relationship (p<0.01) between the two groups.

2.VI Maternal complication

After health education majority of the responses were improved in the study group; 97.6 percent responded decrease in the weight gain process during pregnancy period, frequent urinary tract infection, abortion and frequent respiratory tract infection whereas in the control group highest responses were seen in the area of decrease in the weight gain process during pregnancy period (87.6%).

Significance level - Analysis of relationship between study group and control group was found to be highly significant (p<0.01). Analysis of relationship between the study group and the selected variables was found to be significant in all areas (p<0.05).

2.VII Foetal complications

After health education majority of the responses increased for foetal complications in the study group; 97.1 percent replied intra uterine growth retardation, low birth weight, stillbirth, mentally retarded infant and infant born with anaemia. Whereas in the control group variations were observed; 87.1 percent replied intra uterine growth retardation and 69.4 percent said low birth weight was seen.

Significance level - Analysis of relationship within study group before and after health education and between study and control group after health education and on the second visit were found to be highly significant in all the areas (p<0.01).
2.VIIIA Preventive measures

After the health education majority of the responses increased about awareness of preventive measures in the study group i.e. 97 percent for iron tablet and 95.9 percent for folic acid tablet. And on the second visit in the control group only 81.2 percent replied regarding iron tablet and 87.1 percent regarding folic acid tablet.

**Significance level** - Analysis of relationship within study group before and after health education and between study and control group after health education and on the second visit were highly significant at (p<0.01) level.

2.VIIIB Information received regarding consumption and advantages of iron and folic acid tablets

It was observed that responses were improved after health education regarding consumption and advantages of iron and folic acid tablets. It was (95.9%) in the study group whereas only 40% responses were in the control group.

**Significance level** - Analysis of relationship within study group before and after health education was highly significant (p< 0.01) and between study group and control group it was significant at (p< 0.01) level.

2.VIIC Side effects of the drugs

For side effects of the supplementary drugs it was observed that in the study group after health education majority of the responses seen were in the areas of nausea, vomiting, and constipation (97.8%) whereas in the control group nausea it was 65.9% percent and 48.2 percent responded vomiting on the second visit.

**Significance level** - Analysis of the relationship showed high significance level (p<0.01).

2.VIID Awareness about dietary modification

Ninety eight point two percent responses after health education in study group revealed need to take more amounts of cereals, pulses, nuts as well as germinated grains regularly, and for the rest it was between 97.1 and 97.6 percent; whereas in the control group responses were 55.99% regarding eating any one seasonal fruit.

**Significance level** - Analysis of the relationship showed high significance level (p<0.01).
2.VIIF Importance of cleanliness

In the study group after health education, 97.1 percent responded regarding proper hand washing, nails should be kept short, and proper washing of cooking vessels and 96.5 percent responded that vegetables and fruits should be washed before cutting or eating; whereas on the second visit in the control group 88.8 percent responses were seen in the area of proper hand washing.

Significance level - Analysis of the relationship showed high significance level (p<0.01).

2.VIIF Ways and methods to prevent wastage of nutrient while cooking food

In the study group after health education majority of the respondents (97.6%) said that overcooking should be avoided, too much water should not be added in the foodstuff while cooking and soda bicarbonate should not be added in the food stuffs. Whereas the only 78.8 percent responded positively regarding overcooking in the control group.

Significance level - Analysis of the relationship showed high significance level (p<0.01).

2.VIIFG Awareness of treatment and the drugs needed to cure anaemia

Majority of the responses after health education in the study group stated supplementary medication (97.6%), 97.6 percent intra muscular iron injection and 97.6 percent blood transfusion and 94.7 percent understanding the curative treatment whereas in the control group it was observed that only (62.4%) understood regarding the curative treatment.

Significance level - Analysis of the relationship showed high significance level (p<0.01).
SECTION 3

This section deals with other health practices that help to prevent anaemia during pregnancy.

3.1 Hand washing
In the study group 100 percent responses were seen regarding general hand washing, hand washing before eating and hand washing with water after defecation. Ninety seven point six percent responses were seen in hand washing before cooking, during cooking, after cooking and after care of child. These responses were observed after health education. In the control group 96.5 percent responses were revealed in the areas of general hand washing and hand washing before eating and before cooking. **Significance level** - Analysis of relationship between before and after health education in the study group and study to control group after health education and on the second visit was highly significant (p<0.01).

3.11 Keeping nails short
In the study group, after health education 92.9 percent replied that nails should be kept short once a week whereas it was 92.4 percent before health education. In the control group only 90 percent responded that nails should be kept short once a week. **Significance level** - Analysis of relationship seen in the area of nail cutting was highly significant (p<0.01).

3.111 Cooking practices
Eighty-six point five percent responses revealed after health education in the study group in relation to not washing after cutting the vegetables whereas 87.6 percent responses were seen regarding using iron vessels for cooking. In the control group 82.4 percent responses revealed on the first visit in relation to using iron vessels for cooking and on the second visit responses were 87.6 percent. Before health education 93.5 percent responses were observed in relation to adding more water while preparing food and after health education it was 51.2 percent. Before health education 84.7 percent responses were seen about washing vegetables and fruits after cutting and after health education it was 62.9 percent. Eleven point eight percent
responses were seen in relation to washing fruits before eating before health education and after health education the responses were 51 percent. The questions were asked only. There was no health education yet responses were at satisfactory level.

**Significance level** - Analysis of relationship between before and after health education in the study group and study and control group was highly significant (p<0.01).

### 3.1V Using mishri and consumption of non-food items

It was seen that 50 percent responses were found before health education in the study group in relation to using mishri 3 to 4 times. But it was reduced to 6.5 percent after health education. Even in the control group 31.2 percent responses were seen in the first visit but in the second visit it was only 6.1 percent. Eating non-food items during pregnancy such as ice 4.1 percent, clay 8.2 percent, starch 0.6 percent, mud 7.1 percent, chalk 0.6 percent and any other 1.2 percent responses were found before health education, but after health education responses were not found. In the control group in the first visit the following responses were seen regarding eating non-food items 20 percent, clay 11.8 percent. These practices are dangerous to health.
This section deals with assessment of consumption of diet by the antenatal mothers before and after health education in the study group and on the first visit and during the second visit in the control group.

4.1 Consumption of nutrients before health education

It was seen that before health education, both study and control groups had a similar consumption pattern of protein, iron and calories. There was no significant difference.

4.11 Food consumption in study group before and after health education

It was seen that mean ± S.D. protein increased to 75.7082 ± 8.99 after health education. In the same way iron consumption mean ± S.D was 35.7369 ± 8.335. And calories consumed mean ± S.D were 1898.06 ± 305.81. After health education the study group has shown a significant improvement.

4.111 Food consumption in control group before and after health education

In the control group food consumption increased after the first visit.

4.1V Percentage increase in consumption of food in both groups

Study group has shown a significantly higher percentage improvement, while in control group the percentage improvement in consumption is very less. Both study and control group samples were consuming food twice in a day, and also had morning and evening tea. They were eating rice, dal, vegetables and chapatties. But the amount was not adequate. These were observed according to their nutritive values. But after health education the nutritive values were increased in the study group but not in the control group. In both the groups the respondents were not keeping any fast later.
SECTION 5

Treatment for anaemia

Both study and control group samples were on prophylaxis supplementary drugs. There were no responses regarding curative measures for anaemia. Hence it was not analysed. All the samples had mild to moderate anaemia, which could be cured by preventive measures.
6.1 Analysis of the relationship in the control group

Significant relationship between the selected variables such as age, education, family income, parity, gestational age, antenatal period weight gain differences, and birth weight of newborn, with regard to knowledge and practices in relation to prevention and management of anaemia during pregnancy in the control group on second clinic visit.

6.1.1 Age with regard to knowledge and practices in relation to prevention and management of anaemia.

Age of the samples was divided into two categories i.e. 18 to 25 years and 26 years and above and its relation to prevention and management of anaemia during pregnancy was analysed. There was no statistical relationship in the areas such as awareness of anaemia; levels of haemoglobin lower than normal, less blood cell found in the body. But a significant relation \( p<0.05 \) in loss of red blood cells in blood was seen. There was no statistical relation in functions of haemoglobin \( p>0.05 \). There was no statistical relationship \( p>0.05 \) in pre-disposing factors of anaemia during pregnancy. There was not significant relation \( p>0.05 \) in the areas of causes of anaemia. There was a high significant relationship in physical examination such as lethargy, whereas in all other areas there was no significant relationship \( p>0.05 \). In the areas of maternal complications it was not significant \( p>0.05 \). There was a significant relation \( p<0.05 \) in the areas like stillbirth and infant born with anaemia, whereas in all other areas there was no significant relation \( p>0.05 \). There was no significant relation \( p>0.05 \) in the areas of consumption and advantages and side effects of the supplementary drugs. There was a high significant relation \( p<0.01 \) in the areas such as eat any one seasonal fruit and also a significant relation \( p<0.05 \) in awareness about dietary modification, whereas in all other areas there was no significant relationship \( p>0.05 \). There was no significant relation \( p>0.05 \) in the areas of the cleanliness and ways and measures of cooking. There was a significant relationship \( p<0.05 \) in the areas of dietary modification as a treatment for anaemia. Treatment such as understand the curative treatment, oral iron supplementary medication, intramuscular iron injection, blood transfusion had no significant relation \( p>0.05 \). Hand washing, as a preventive practice had no significant relationship
as well as health habit of nail cutting was not significant \( p > 0.05 \). Cooking practices like using iron vessels for cooking, adding more water while preparing food, washes vegetables and fruits after cutting, washes fruits before eating were not significantly related \( p > 0.05 \). There was also no significant relationship between age and consumption of food in terms of protein, iron and calories.

6.1.2 Analysis of the relationship between education and prevention and management of anaemia during pregnancy.

The education of the respondents was divided into two categories: 1. Illiterate and can read and write and 2. Primary and above. Meaning of anaemia and education showed no significant relation \( p > 0.05 \) in all the areas. There was no significant relation \( p > 0.05 \) in the areas of functions of haemoglobin and education. There was a significant relation \( p > 0.05 \) in malnutrition as a pre-disposing factor of anaemia, whereas in all other areas of pre-disposing factors of anaemia there was no significant relation \( p > 0.05 \). There was no significant relation \( p > 0.05 \) in the areas of causes of anaemia and education. There was no significant relation \( p > 0.05 \) in physical examination in terms of symptoms and signs of anaemia and education. There was a significant relation \( p < 0.05 \) in decrease in weight gain process during pregnancy period as a maternal complication and education, but in all other areas there was no significant relation \( p > 0.05 \). There was a high significant relation \( p < 0.01 \) in low birth weight as a foetal complication, but in other foetal complications there was no significant relation \( p > 0.05 \). There was no significant relation \( p > 0.05 \) in the areas of preventive measures as well as consumption and advantages of supplementary drugs and its side effects. There was no significant relation \( p > 0.05 \) in all other areas of dietary modification. There was no significant relation \( p > 0.05 \) in all areas of cleanliness. There was a high significant relation \( p < 0.01 \) in avoid over cooking and also a significant relation \( p < 0.05 \) in should not add soda bi carbonate in the foodstuff as a way and measures of cooking, but in other areas there was no significance \( p > 0.05 \). There was no significant relation \( p > 0.05 \) in all the areas of treatment for anaemia and education. There was no significant relation \( p > 0.05 \) in all the areas of hand washing practices and education. Also no significance \( p > 0.05 \) in health habit of nail cutting once a week, twice a week or any time cutting nails was seen. There was a high significant relationship \( p < 0.01 \) in washes fruits before eating and education. But in all other areas of cooking practices there was no significant
6.1.3 Analysis of the relationship between income and the prevention and management of anaemia during pregnancy.

The income of the respondents was divided into two categories i.e. Rs.1000 to 3000 and Rs.3001 and above. There was a significant relation (p<0.05) in loss of red blood cells in blood, whereas in other areas there was no significant relation (p>0.05). There was a significant relation (p<0.05) in functions of haemoglobin such as provide nutrients to each cell of the body, but all other areas there was no significant relation (p>0.05). Pre-disposing factors of anaemia such as elderly primi had a significant relation (p<0.05), whereas in all other areas there was no significant relation (p>0.05). Causes of anaemia and income had no significant relation (p>0.05). There was no significant relation (p>0.05) in physical findings in terms of symptoms and signs of anaemia. There was a significant relation (p<0.05) in antepartum haemorrhage as a maternal complication, but other maternal complications had no significant relation (p>0.05). There was no significant relation (p>0.05) in the areas of all foetal complications. Also there was no significant relation (p>0.05) in the areas of preventive measures. There was no significant relation (p>0.05) in consumption and advantages of the supplementary drugs as well as its side effects. There was a high significant relation (p<0.01) in the area of drink adequate pure water. There was also a significant relation (p<0.05) in eating green leafy vegetables and other vegetables daily, but other areas of dietary modification there was no significant relation (p>0.05). There was no significant relation (p>0.05) in the areas of cleanliness. There was a significant relation (p<0.05) in avoiding over cooking, but other areas of ways and methods of cooking were not significant (p>0.05). There was a significant relation (p>0.05) in treatment of anaemia such as dietary modification; where as other areas of treatment of anaemia had no significant relation (p>0.05). There was no significant relation (p>0.05) in areas of hand washing practices. There was no significant relation (p>0.05) in the areas of health habit of cutting the nails once a week, twice a week or any time. There was a significant relation (p<0.05) in the area of washes vegetables and fruits after cutting but in other cooking practices there was no significant relation (p>0.05). There was no significant relation (p>0.05) between income and consumption of food in terms of protein, iron and calories.
6.1.4 Analysis of the relationship between parity and the prevention and management of anaemia during pregnancy.

The parity of the respondents was divided into two categories i.e. para 0 and para one and above. Meaning of anaemia and parity showed no significant relation (p>0.05) in all areas. There was no significant relation (p>0.05) in the areas of functions of haemoglobin and pre-disposing factors of anaemia. There was a high significant relation (p<0.01) in the area of worm infestation as a cause of anaemia, but other causes of anaemia had no significant relation (p>0.05). There was no significant relation (p>0.05) in the areas of physical findings in terms of symptoms and signs of anaemia. There was a significant relation in maternal complications like decrease in the weight gain process during pregnancy period (p<0.05), where as other maternal complications had no significant relation (p>0.05) with parity. There was no significant relation (p>0.05) in the areas of foetal complications and parity, preventive measures for anaemia, and advantages of supplementary drugs and its side effects. There was no significant relation (p>0.05) in the area of cleanliness to prevent anaemia, ways and measures of cooking. There was no significant relation (p>0.05) in the areas of treatment to cure anaemia and parity. There was no significant relation (p>0.05) in the areas of hand washing practices. No significance (p>0.05) was seen in the areas of health habit of nail cutting. There was also no significant relation (p>0.05) in the areas of cooking practices, as well as consumption of food in terms of protein, iron and calories and parity.

6.1.5 Analysis of the relationship between gestational age and the prevention and management of anaemia during pregnancy.

The gestational age of the respondents was divided into two categories, i.e. below 28 th week of gestational age and above 28 th week. Meaning of anaemia showed no significant relation (p>0.05) in all the areas. There was no significant relation (p>0.05) in the areas of functions of haemoglobin as well as, pre-disposing factors of anaemia with. There was gestational age significant relation (p>0.05) in faulty food habits as a cause of anaemia, whereas other causes of anaemia had no significant relation (p>0.05). There was no significant relation (p>0.05) in the areas of physical findings in terms of symptoms and signs of anaemia and gestational age. Maternal complications, as well as foetal complications preventive measures and gestational
age showed no significant relation (p>0.05). There was no significant relation (p>0.05) in the areas of consumption and advantages of supplementary drugs and its side effects. There was no significant relation (p>0.05) in the areas of dietary modification and gestational age as well as in cleanliness and gestational age. There was no significant relation (p>0.05) in the areas of ways and measures of cooking. Treatment of anaemia and gestational age showed no significant relation (p>0.05) in all the areas. There was no significant relation (p>0.05) in the areas of hand washing practices, as well as health habit of nail cutting once a week, twice a week or any time cutting the nails and gestational age. Cooking practices and gestational age showed no significant relation (p>0.05) in all the areas. There was also no significant relation (p>0.05) in consumption of food in terms of protein, iron and calories and gestational age.

6.1.6 Analysis of the relationship between weight gain differences and the prevention and management of anaemia during pregnancy.

The weight gain differences of the respondents were divided into two categories i.e. below 1 kg and above 1 kg weight gain differences. There was no significant relation (p>0.05) in all the areas in meaning of anaemia. Functions of haemoglobin and weight gain differences showed no significant relation (p>0.05) in all the areas. There was no significant relation (p>0.05) in all the areas of predisposing factors of anaemia and weight gain differences. Causes of anaemia and weight gain differences, physical examination in terms of symptoms and signs and weight gain differences also showed no significant relation (p>0.05). There was a significant relation (p>0.05) in decreases in the weight gain process during pregnancy period as a maternal complication in anaemia during pregnancy. Where as other maternal complications showed no significant relation (p>0.05). There was no significant relation (p>0.05) in all the areas of foetal complications. There was no significant relation (p>0.05) in preventive measures of anaemia as well as consumption and advantages of supplementary drugs and its side effects with weight gain difference. There was high significant relation (p>0.01) in needs to take more amounts of cereals, pulses, nuts as a dietary modification, but in all other areas of dietary modification there was no significant relation (p>0.05). There was no significant relation (p>0.05) in all the areas of cleanliness and weight gain difference. There was no significant relation (p>0.05) in all the areas in ways and measures of
cooking. Treatment of anaemia and weight gain differences also showed no significant relationship \((p>0.05)\) in all the areas. There was no significant relation \((p>0.05)\) in all the areas of hand washing practices, as well as in health habit of nail cutting once a week, twice a week or any time cutting the nails. There was no significant relation \((p>0.05)\) relation in all the areas of cooking practices as well as in consumption of food in terms of protein, iron, calories and weight gain differences.

6.1.7 Analysis of the relationship between weight gain between birth weight of new borns and the prevention and management of anaemia during pregnancy.

The birth weight of newborns of the respondents was divided into two categories i.e. 2500 to 2999 grams and 3000 grams and above. There was a significant relation \((p>0.05)\) in less blood cell found in the body as a meaning of anaemia, but in all other areas there was no significant relation \((p>0.05)\). Functions of haemoglobin and birth weight of newborns had showed a no significant relation \((p>0.05)\) in all the areas of pre-disposing factors as well as in causes of anaemia and birth weight of newborns. There was no significant relation \((p>0.05)\) in physical findings in terms of symptoms and signs of anaemia and birth weight of new borns. Maternal complications and focial complications also showed no significance. Preventive measures and birth weight showed no significant relation \((p>0.05)\) in all the areas. There was no significant relation \((p>0.05)\) in consumption and advantages of the supplementary drugs and its side effects. There was also no significant relation \((p>0.05)\) in all the areas of dietary modification. There was no significant relation \((p>0.05)\) in all the areas of cleanliness and birth weight of newborns. There was no significant relation \((p>0.05)\) in all the areas of ways and measures of cooking. Treatment of anaemia and birth weight of new borns also showed no significant relation \((p>0.05)\). There was no significant relation \((p>0.05)\) in all the areas of hand washing practices as well as health habit of nail cutting once a week, twice a week and any time cutting the nail. There was no significant relation \((p>0.05)\) in all the areas of cooking practices as well as in consumption of food in terms of protein, iron and calories. Haemoglobin differences during antenatal period and postnatal haemoglobin status of the samples in the control group was not analysed as their responses were observed in the first category only.
6.2 Analysis of relationship in study group

Analysis of the data was done to find out the significant relationship between the nine selected variables such as age, education, income, parity, gestational age, antenatal period weight, haemoglobin status during antenatal period and post natal period, and birth weight of neonate, with regard to knowledge and practices in relation to prevention and management of anaemia during pregnancy in the study group after health education.

6.2.1 Age with regard to knowledge and practices in relation to prevention and management of anaemia

Age of the samples was divided into two categories i.e. 18 to 25 years and 26 years and above and its relation with prevention and management of anaemia during pregnancy was analysed. There was no statistical relationship between age and in the areas of awareness of anaemia, levels of haemoglobin lower than normal, loss of blood cells in the blood, less blood cell found in the body (p>0.05). There was a high significant relationship (p<0.01) found in the area of carrying oxygen to each cell of the body. There was also a significant relationship (p<0.05) in the area of providing nutrients to each cell of the body and carrying carbon dioxide from the cells to the lungs. There was no statistical relationship (p>0.05) in pre-disposing factors of anaemia during pregnancy as well as in the area of causes of anaemia. There was a high significant relationship in physical findings such as pain in the legs and fatigue; also there was a significant relationship (p<0.05) with breathlessness. Signs of anaemia, like pink nails, bright red conjunctiva, bright red tongue, were highly significant (p<0.01). Maternal complications like pregnancy-induced hypertension and pre-eclampsia were also highly significant (p<0.01). Foetal complications were statistically not significant (p>0.05). Preventive measures such as awareness about preventive measures, consumption of supplementary drugs and its advantages were not significant. Side effects of the drugs and age showed no significant relationship (p>0.05). Dietary modification and age also showed no significant relationship. Cleanliness such as proper hand washing and nails should be kept short showed a strong significant relationship (p<0.01) and a significant relationship (p<0.05) was also found between proper washing of cooking vessels and vegetables and fruits should be washed before cutting or eating. Ways and methods to prevent wastage of nutrients while cooking showed no significant relationship (p>0.05). Treatment of
anaemia with regard to age showed no significant relationship (p>0.05). Hand
washing on different occasions like general hand washing, before and after eating
hand washing, washing hands during and after cooking, hand washing after care of
child, after defecation, hand washing with water only, after defecation hand washing
with soap and water and health habit such as nail cutting, cooking practices with
regard to age showed no significant relationship (p>0.05). There was also no
significant relationship between age and consumption of food in terms of protein and
iron. There was a significant relationship between age and calories at p<0.05 level.

6.2.2 Analysis of the relationship between the education and prevention
and management of anaemia during pregnancy

The education of the respondents was divided into two categories i.e. illiterate
and can read and above and its relationship with prevention and management of
anaemia during pregnancy was analysed. There was a significant relationship
(p<0.05) in the area of loss of red blood cells in the blood. Functions of haemoglobin
and education showed a high significant relationship (p<0.01). Pre-disposing factors
such as teenage pregnancies elderly primi and education also were highly significant
(p<0.01). Causes of anaemia such as poor absorption of iron foodstuff, worm
infestation, and infection with regard to education showed a high significant
relationship (p<0.01). There was also a high significant relationship (p<0.01) in the
areas of decreased iron foodstuff in the diet and blood loss. Awareness of symptoms
with regard to education was found statistically significant (p<0.01). Physical
examination findings such as mild / moderate dizziness, tiredness and headache with
regard to education showed a high significant relationship (p<0.01). Maternal
complications such as decrease in the weight gain process during pregnancy period,
frequent urinary tract infection and pregnancy induced hypertension with regard to
education showed a high significant relationship (p<0.01). There was also a
significant relationship found in the areas of frequent respiratory tract infection and
pre-term labour (p<0.05). Foetal complications such as mentally retarded infant and
infants born with anaemia with regard to education showed a high significant
relationship (p<0.01). Preventive measures such as consumption of supplementary
drugs and its advantages with regard to education showed a highly significant
relationship (p<0.01). Side effects of the supplementary drugs such as nausea and
vomiting with regard to education showed a high significant relationship (p<0.01).
There was also a high significant relationship (p<0.01) in the area of awareness about dietary modification. Other areas such as eating green leafy vegetables and other vegetables daily and drinking milk regularly were also found to be significant (p<0.05). Cleanliness such as proper washing of cooking vessels and vegetables and fruits being washed before cutting or eating with regard to education was found to be highly significant (p<0.01). There was also a significant relationship in the area of proper hand washing and keeping short nails (p<0.05). Ways and methods of cooking practice such as not adding soda bi carbonate in the foodstuff with regard to education showed a highly significant relationship (p<0.01). Treatment of anaemia such as understanding the curative treatment by oral iron supplementary medication and by blood transfusion with regard to education showed a significant relationship (p<0.05). Hand washing before cooking with regard to education was found to be highly significant (p<0.01). There was also a significant relationship (p<0.05) in the areas of general hand washing, after cooking hand washing, hand washing with water after defecation and after defecation hand washing with soap and water. Health habit such as nails should be cut any time of the week with regard to education showed a highly significant level (p<0.01). Not washing fruits and vegetables after cutting was found to be highly significant. There was also a significant relation in the areas such as nails should be cut once in a week, using iron vessels for cooking and washing fruits before eating fruits (p<0.05). There was no significant relation between education and consumption of foods in terms of nutrients such as protein, iron and calories.

6.2.4 Analysis of the relationship between income and the prevention and management of anaemia during pregnancy

The income of the respondents was divided into two categories i.e. Rs.1000 to 3000 and Rs.3001 and above. There was a significant relationship between awareness of anaemia and income (p<0.05). Functions of haemoglobin such as providing nutrients to each cell of the body and carrying carbon dioxide from the cells to the lungs were highly significant (p<0.01). There was a high significant relation (p<0.01) between income and pre-disposing factors such as teenage pregnancies, elderly primi and increased foetal demand. Causes of anaemia such as worm infestation and blood loss were also highly significant (p<0.01). Relationship between income and awareness of symptoms was not statistically significant. Physical examination such as loss of appetite, pain in the legs, lethargy and fatigue were highly significant. Signs of
anaemia were not significant. There was no significant relationship between income and maternal complications. There was a strong significant relationship (p<0.01) between income and foetal complications such as intra uterine growth retardation, low birth weight, stillbirth, mentally retarded infant and infants born with anaemia. Preventive measures such as consumption of supplementary drugs and its advantages showed no significant relationship with income, only calcium tablet showed a significant relationship at p<0.05 level. Side effects of supplementary drugs such as nausea and vomiting showed a high significant relation with income (p<0.01). There was no significant relationship between income and dietary modification (p>0.05). There was also no significant relationship between income and cleanliness (p>0.05). There was no significant relationship between ways and methods to prevent anaemia with regard to income (p>0.05). Treatment for anaemia such as intra muscular iron injection and blood transfusion were highly significant (p<0.01). Hand washing such as hand washing with soap and water after defecation with regard to income was highly significant (p<0.01). There was also a significant relationship (p<0.05) between income and hand washing after defecation and hand washing with water only. There was a highly significant relationship (p<0.01) between income and adding more water while preparing food, and washing fruits before eating them. There was also a significant relationship (p<0.05) between income and washing vegetables and fruits after cutting and cutting the nails twice in a week. There was no significant relation between family income and consumption of food in terms of nutrients such as proteins, iron and calories.

6.2.5 Analysis of the relationship between parity and prevention and management of anaemia during pregnancy

Meaning of anaemia and parity showed a significant relationship in the area of loss of red blood cells in the blood (p<0.05). There was no significance (p>0.05) between parity and function of haemoglobin. There was also no significant relation (p>0.05) between parity and pre-disposing factors of anaemia. There was no significant relation (p>0.05) between parity and causes of anaemia. There was no significant relation (p>0.05) between physical examination such as tiredness, dizziness, pain in the legs, nails pink and mild pink, conjunctiva red and mild red, with parity. There was a high significant relation (p<0.01) in maternal complications such as pre-eclampsia and parity. Other complications had no significant relations.
There was also no significant relation (p>0.05) between parity and foetal complications. There was no significant relation (p>0.05) between parity and consumption of supplementary drugs and its advantages. There was also no significant relation (p>0.05) between parity and side effects of supplementary drugs. There was no significant relation (p>0.05) between parity and dietary modification. There was also no significant relation (p>0.05) between parity and cleanliness. No significant relationship (p>0.05) was found between parity and ways and methods to prevent anaemia. There was also no significant relation (p>0.05) between parity and treatment of anaemia. There was no significant relation (p>0.05) between parity and hand washing. There was also no significant relation (p>0.05) between parity and health habit such as nail cutting and cooking practices. There was no significant relationship between parity and consumption of food in terms of nutrients such as proteins, iron and calories.

6.2.6 Analysis of the relationship between gestational age and prevention and management of anaemia during pregnancy

There was a significant relation (p<0.05) in the areas of awareness of anaemia and levels of haemoglobin lower than normal. Function of haemoglobin such as providing nutrients to each cell of the body, carrying carbon dioxide from the cells to the lungs and keeping the organs active for normal function were found to be statistically significant (p<0.05). Pre-disposing factors of anaemia such as multiparity, too close deliveries, teenage pregnancies, elderly primi, increased foetal demand and pregnancy with fibroid uterus were also found to be significantly related (p<0.05). Causes of anaemia such as faulty food habits, worm infestation, blood loss, and infection were found to be significantly related (p<0.05). There was also a significant relation (p<0.05) between physical examination and gestational age. In the areas of weakness, loss of appetite, headache, pain in the legs, breathlessness, lethargy and fatigue were significantly related (p < 0.05). Signs of anaemia such as nails pink and mild pink conjunctiva, bright red and mild red, tongue bright red and mild red had a significant relationship (p < 0.05). Maternal complications such as antepartum haemorrhage, and pre-eclampsia were highly significant (p<0.01). The areas such as decrease in weight gain in the pregnancy period, frequent urinary tract infection, abortion, frequent respiratory tract infection, heart failure and pre-term labour showed a significant relationship (p<0.05). Foetal complications, such as intra uterine growth
retardation, low birth weight, stillbirth, mentally retarded infants and infants born with anaemia were found to be significantly related with gestational age (p<0.05). Preventive measures such as supplementary drugs like iron, folic acid, and calcium tablets were found to be statistically significant (p<0.05). Receiving information about consumption of iron and folic acid tablets and information about advantages of iron and folic acid tablets were significant (p<0.05). Side effects of supplementary drug such as nausea vomiting and constipation were statistically significant (p<0.05). There was a significant relationship (p<0.05) between gestational age and dietary modification need to take more amount of cereals, pulses, nuts, take germinated grains regularly, eat fish, mutton, liver, kidneys and eggs more often. Eat any one seasonal fruits, eat green leafy vegetables daily, other vegetables and drink milk regularly, and drink pure water adequately were statistically significant (p<0.05). Cleanliness such as proper hand washing, nails should be kept short, proper washing of cooking vessels and vegetables and fruits should be washed before cutting or eating were statistically significant (p<0.05). Ways and methods to prevent anaemia such as avoid over cooking, avoid adding too much water in the foodstuff while cooking, should not add soda bi carbonate in the foodstuff, and use iron pots, iron tava, iron khadai for cooking were significant (p<0.05). Treatment for anaemia such as understanding the curative treatment; by oral iron supplementary medication, intra muscular iron injection, blood transfusion and dietary modification, were statistically significant (p<0.05) with gestational age. Hand washing practices such as general hand washing; before eating, before cooking, during cooking, after cooking, and after caring for child, showed a highly significant relation (p<0.05) with gestational age. Health habit such as nail cutting practices once a week, and twice a week was significant (p<0.05). Cooking practices such as using iron vessels for cooking, adding more water while preparing food showed a significant relationship with gestational age. There was also a significant relationship between gestational age and calories but there was no significant relationship between gestational age and iron and protein nutrients.

6.2.7 Analysis of the relationship between weight gain and prevention and management of anaemia during pregnancy

Meaning of anaemia and weight gain during antenatal period showed a significant relation (p<0.05). In the areas of awareness of anaemia, levels of
haemoglobin lower than normal, loss of red blood cells in blood and loss of blood cells found in the body, and weight gain during antenatal period showed a significant relation \( p < 0.05 \). Functions of haemoglobin such as carrying oxygen to each cell of the body, providing nutrients to each cell of the body, carrying carbon-dioxide from the cells to the lungs and keeping the organs active for normal functions showed a highly significant relation \( p < 0.01 \) with weight gain. Pre-disposing factors such as too close deliveries, multiparity, teenage pregnancies, elderly primi, increased foetal demand and pregnancy with fibroid uterus were statistically significant \( p < 0.05 \).

Causes of anaemia such as poor absorption of iron foodstuffs and decreased iron foodstuffs in the diet were highly significant \( p < 0.01 \) with weight gain. Other areas such as low food intake faulty food habits, worm infestation, blood loss and infection were also significant \( p < 0.05 \) with weight gain. Awareness of symptoms was also significant \( p < 0.05 \). Physical findings such as lethargy, pink nails, bright red conjunctiva and bright red tongue were highly significant \( p < 0.01 \). Other areas such as mild weakness, mild dizziness, mild tiredness, mild loss of appetite, mild headache, mild pain in the legs, mild breathlessness and mild fatigue were also significant \( p < 0.05 \).

Maternal complications such as pregnancy induced hypertension, antepartum haemorrhage, abortion, frequent respiratory tract infections, heart failure and pre-term labour were statistically significant \( p < 0.05 \) with weight gain. The relation between foetal complications and weight gain was significant \( p < 0.05 \) in the areas of intrauterine growth retardation, low birth weight, still birth, mentally retarded infant and infant born with anaemia. Preventive measures such as awareness regarding preventive measures, supplementary drugs like iron and folic acid tablets were statistically significant \( p < 0.05 \). Information received regarding consumption and advantages of supplementary drugs was also statistically significant \( p < 0.05 \). Side effects of supplementary drugs like nausea, vomiting, constipation, and diarrhoea were also significantly related \( p < 0.05 \) with weight gain. Dietary modification and weight gain was highly significantly related \( p < 0.01 \) in the areas of drinking milk regularly, and drinking pure water adequately. Awareness about dietary modification, need to take more amounts of cereals, pulses, nut, take germinated grains regularly, eat fish, mutton, liver, kidneys and eggs more often, eat any one seasonal fruit, and eat green leafy vegetables and other vegetables daily were also significant \( p < 0.05 \). Cleanliness as a preventive measures was significant \( p < 0.05 \) in the areas of proper washing of cooking vessels and vegetables and washing fruits before cutting or
eating. Ways and methods to prevent anaemia such as avoid over cooking, avoid adding too much water in the foodstuffs while cooking, avoid adding soda bicarbonate in the foodstuffs, and use of iron pots, iron tava, iron kadai for cooking were significantly related (p<0.05). The relationship between treatment of anaemia and weight gain was significant (p<0.05). In the areas such as understanding the curative treatment: by oral iron supplementary medication, intra muscular iron injection, blood transfusion and dietary modifications, was also significant (p<0.05). The relationship between hand washing and weight gain was also significant (p<0.05) in the areas of general hand washing; before eating, before cooking, during and after cooking, after care of child and hand washing after defecation, were all significant (p<0.05). Health habit practice like cutting nails once a week and twice a week was also significant (p<0.05). Cooking practices such as use iron vessels for cooking, adding more water while preparing food, washes after cutting vegetables and fruits and washes before at eating fruits were all significant (p<0.05). There was a high significant relation between calories and weight gain difference during antenatal period. Whereas there was no significant relation between weight gain differences during antenatal period and consumption of iron and protein nutrients.

6.2.8 Analysis of the relationship between birth weight of newborns and prevention and management of anaemia during pregnancy

Meaning of anaemia and birth weight of newborn showed a significant relationship (p<0.05) in the area of loss of red blood cells in blood. Functions of haemoglobin such as carrying carbon dioxide from the cells to the lungs was highly significant (p<0.01). Pre-disposing factors and birth weight of newborns were statistically not significant (p>0.05). Causes of anaemia such as infection was significant (p<0.05), while remaining areas were not significant. Physical findings like moderate weakness was significant (p<0.05). And fatigue, pink nails had a high significant relationship (p<0.01) with birth weight of newborns. Maternal complications and birth weight of newborn were not statistically significant (p>0.05). Foetal complications such as mentally retarded infants and infants born with anaemia were significant (p<0.05). Preventive measure such as supplementary drugs like calcium was significant (p<0.05). Preventive measures such as awareness about preventive measures was not significant (p>0.05) whereas supplementary medication like calcium tablet was highly significant (p<0.01). Information received about
consumption and advantages of the supplementary drugs were not significant (p>0.05). There was a significant relation (p<0.05) in the areas of nausea and vomiting with birth weight of newborns. Dietary modification such as eat any seasonal fruits, eat green leafy vegetables and other vegetables and drink milk regularly, and drink pure water adequately were significant (p<0.05) with birth weight of newborn. Cleanliness as a preventive measure and birth weight of newborn was not significant (p>0.05). Ways and methods to prevent anaemia such as avoid overcooking, avoid adding too much water in the foodstuffs while cooking and avoid adding soda bicarbonate in the foodstuffs was significant (p<0.05) with birth weight of newborn. Treatment for anaemia like oral iron supplementary medication, intramuscular iron injection, blood transfusion and dietary modification was statistically significant (p<0.05). Hand washing practices such as hand washing after caring of child, after defecation hand washing with water only and after defecation hand washing with soap and water also showed a significant relationship (p<0.05) with birth weight of newborns. Health habits like cutting nails once a week, twice a week and cutting the nails any time were not significant with birth weight of newborns (p>0.05). Cooking practices such as adding more water while preparing food, washes vegetables and fruits after cutting, washes fruits before eating were statistically significant (p<0.05). There was no significant relation between birth weight of newborns and consumption of foods by the mothers, in terms of nutrients such as protein, iron and calories.

6.2.9 Analysis of the relationship between antenatal period haemoglobin differences and prevention and management of anaemia during pregnancy

Awareness of anaemia was significant (p<0.05). Meaning of anaemia such as levels of haemoglobin lower than normal, loss of red blood cells in blood, less blood cell found in the body were significant (p<0.05) with antenatal period haemoglobin differences. Functions of haemoglobin such as carry oxygen to each cell of the body, provide nutrients to each cell of the body, carry carbon-dioxide from the cells to the lungs and keep the organs active for normal functions were significant (p<0.05) with antenatal period haemoglobin. Pre-disposing factors such as malnutrition, frequent diarrhoea, too close deliveries, multiparity, teenage pregnancies, elderly primi, increased foetal demand and pregnancy with fibroid uterus were also statistically
significant (p<0.05). Causes of anaemia such as decreased iron foodstuff in the diet, worm infestation, blood loss and infection were also significant (p<0.05). There was a significant relation (p<0.05) between awareness about symptoms and antenatal period haemoglobin differences. Physical findings such as mild weakness, loss of appetite, headache, breathlessness, lethargy and mild / moderate fatigue were significant (p<0.05). There was a highly significant relationship (p<0.01) in the areas of bright red and mild red tongue. And in the areas of pink nails and bright red conjunctiva were significant (p<0.05). Maternal complications such as decrease in the weight gain process during pregnancy period, frequent urinary tract infection, pregnancy induced hypertension, pre-eclampsia, antepartum haemorrhage, abortion, frequent respiratory tract infections, heart failure, and pre-term labour were significant with antenatal period haemoglobin differences (p<0.05). Foetal complications like low birth weight, stillbirth, mentally retarded infant and infant born with anaemia were also significant (p<0.05). Preventive measures and antenatal period showed significant relation (p<0.05) in areas such as supplementary medication like iron, folic acid and calcium tablets. Information received about consumption and advantages of drugs were also significant (p<0.05). Side effects of supplementary drugs such as nausea, vomiting, constipation, and diarrhoea were significant (p<0.05). Dietary modification like awareness about dietary modification, need to take more amounts of cereals, pulses, nuts, take germinated grains regularly, eat fish, mutton, liver, kidneys and eggs more often, eat any one seasonal fruit, eat green leafy vegetables and other vegetables daily, drink milk regularly and drink pure water adequately showed a significant relation with antenatal period haemoglobin differences. Cleanliness to prevent anaemia such as proper hand washing, nails should be kept short, proper washing of cooking vessels, and vegetables and fruits should be washed before cutting or eating also showed a significant relation with antenatal period haemoglobin differences (p<0.05). Ways and methods to prevent anaemia such as avoid over cooking, avoid adding too much water in the foodstuffs while cooking, avoid adding soda bicarbonate in the foodstuff, and use iron pots, iron tava, iron kadai for cooking showed a significant relation (p<0.05). Treatment for anaemia and antenatal period haemoglobin differences was significant at (p<0.05) level. Hand washing practices such as hand washing after cooking, hand washing after defecation, hand washing after defecation hand washing with water only and after defecation hand washing with soap and water, were also significant (p<0.05). Health habit such as nail cutting once a week, twice a
week or any time cutting the nails were statistically significant (p<0.05). Cooking practices like using iron vessels for cooking, adding more water while preparing food, washing vegetables and fruits after cutting, washing fruits after cutting were significant (p<0.05). There was no significant relation between haemoglobin difference in antenatal period and consumption of food by the mothers in terms of nutrients like protein, iron and calories.

5.3 CONCLUSION

This study reveals that anaemia during pregnancy is a common problem for majority of women. This problem is neglected by the women themselves, this can be seen by the absenteeism observed by the researcher at the antenatal clinic during monsoon (this also delayed data collection). The following conclusions were made on the basis of the result of data analysis.

1. Majority of the mothers were Hindus in the age group of 18-25 years in both groups. They had primary level education, were staying in chawls in urban slum areas and belonged to low socio-economic groups.

2. Majority of the mothers were primi para, maximum parity was para 3, having two children. Anaemia was a health problem observed in previous pregnancies and nature of deliveries was normal.

3. Majority of the mothers had received deworming agents.

4. The haemoglobin value during antenatal period in both, study and control groups were similar. But after health education, study group had shown significant improvement in the haemoglobin value.

5. The gestational period varied in all the samples at the time of first visit. The average weight gain was taken by that variable. In the study group it was clearly seen that if health education was given in early weeks of gestation, average weight gain was more in comparison to late gestation.

6. The postnatal haemoglobin status in study and control group showed mean ± S D value in study group as 11.3266 ± 0.528 and for control group it was 10.1691 ± 0.516. There was a high significant relationship between the two groups.
7. The birth weight of infants in the study and control group; the study group’s mean ± SD value was 2946.4557 ± 159.530 and the control group’s was 2624-6711 ± 245.219. There was highly significant relationship between the two groups.

8. Majority of the mothers had inadequate knowledge before health education but after health education their knowledge level was improved in areas such as meaning of anaemia, functions of haemoglobin, pre-disposing factors, causes of anaemia, symptoms and signs of anaemia, maternal and foetal complications, preventive measures such as supplementary medications, health habits, cooking practices and treatment for anaemia.

9. Before health education in the study group and on the first visit in the control group similar consumption pattern of protein, iron and calorie intake was seen. After health education, study group had shown a significant improvement in the diet. It was statistically significant.

10. Analysis of relationship between study group, before and after health education was found to be highly significant. Relationship between study and control group after health education was also found to be highly significant in all the variables.

11. In the study group, after health education, significant relationship existed between most of the selected variables such as age, education, family income, gestational age, parity antenatal period weight gain differences, haemoglobin value differences during antenatal period, birth weight of newborns and postnatal period haemoglobin value and prevention and management of anaemia during pregnancy.

12. The practices such as hand washing, health practices such as keeping short nails, cooking practices using mishri and eating non-food items were improved after the health education. Health education is the only mean to bring about awareness among pregnant women.

13. In the study group, after health education, there were increased haemoglobin differences during antenatal period of the sample. Birth weight of newborn in the study group was more than that in the control group. It was clearly seen that planned health education program helped to improve the knowledge and practices in relation to prevention and management of anaemia during pregnancy.

14. Significant relationship didn’t exist between majority of the seven selected variables in the control group in the second clinical visit, such as age, education, income, gestational age, parity, antenatal period weight gain differences and birth weight of the newborns, and prevention and management of anaemia during pregnancy.
pregnancy. As the respondent didn't respond during the second category, analysis was not done for two variables viz. haemoglobin differences between antenatal period and postnatal haemoglobin status.

**IMPLICATIONS**

The findings of the study have several implications for the nursing profession.

1. **Nursing Practice**

   The knowledge deficit among pregnant mothers about prevention and management of anaemia during pregnancy was clearly seen. Health education is an integral component of nursing practice. Hence, apart from incidental teaching, nursing personnel should conduct planned health teaching programs for mothers regarding prevention of anaemia during pregnancy. Some of the areas are recognizing symptoms and causes of anaemia and pre-disposing factors. This can be undertaken in wards and antenatal clinics / departments. Nurses in maternal units must recognize the learning needs of all pregnant women, and should identify teaching goals and develop strategies to accomplishing the objectives. Strategies for teaching pregnant women should be based on individual needs. Teaching strategies like lecture, discussion and demonstration can be used and can be further supplemented by using videotapes and written materials.

   The findings of this study regarding knowledge and practices about prevention and management of anaemia during pregnancy can be used as a base line data by nurses while imparting health education to mothers regarding prevention and management of anaemia during pregnancy.

   Nursing service departments can have a health education cell with a group of adequately trained nurses for developing health education material for teaching expectant mothers and families. Health education programs on prevention and management of anaemia during pregnancy can be conducted by trained nurses in antenatal wards for pregnant mothers. It is a fact that the nurses have the ability and time to teach the mothers about various aspects of anaemia in pregnancy and antenatal
care, as the nurses are with the mothers from the time of admission to discharge and she knows the deficits of the mothers at all levels.

The community health nurse has an important health educator’s role in the community. While visiting antenatal mothers in their houses or while doing home visits she can provide necessary information to expectant mothers about prevention and management of anaemia during pregnancy. It is the nurse’s responsibility to assess the knowledge and practices of each mother and educate the mothers regarding prevention and management of anaemia during pregnancy.

2. Nursing Education

The finding of this study will assist nurse educators in carrying out curricular changes in subjects like Midwifery, Gynaecology, Medical Surgical Nursing, Nutrition, Hygiene and Community Health Nursing particularly in relation to health care of women before and during pregnancy.

The nursing curriculum of maternal and child health care programme should include learning experiences for the students to assess, plan, implement and evaluate nursing interventions based on the felt needs of mothers regarding prevention and management of anaemia during pregnancy. Curriculum of post certificate and graduate programmes of nursing need to include learning experiences, teaching modules, programme instructions for teaching expectant mothers regarding prevention and management of anaemia during pregnancy.

Nursing personnel working in the antenatal wards, antenatal out patient department and postnatal wards should be given in-service education update to improve their abilities in terms of knowledge, skills and attitudes in identifying mother’s needs.

Health education can be carried out through various people like community health nurses and other health team members. They would be successful if held in collaboration with various agencies. These agencies may be Non Government Organisations, Mahila Mandals, Youth Clubs, Bhajan Mandals, schools, I.C.D.S. and other voluntary organization. Such collaborations will facilitate preventive, promotive
and curative services for controlling and preventing anaemia during pregnancy. Anaemia control through primary health care should therefore be seen not as an isolated activity but as an integral part of total health care and socio-economic development.

3. Nursing Research

The study has provided an understanding of common health problems of pregnant women and the effectiveness of planned interventions provided to pregnant women. The result has opened up avenues for further studies in these areas.

Suggestions

During the course of the study it was evident that certain basic things are very certain for the health of pregnant women. These are as follows:

1. Elementary education should be made compulsory with more emphasis on girl's education. Though these facilities are provided by the government there is need to find out its real effect at the implementation level.

2. Child to child programme includes anaemia in its content but it should be implemented at all levels.

3. Need to prepare teaching modules for a woman to women is a must.

4. Team approach, collaboration and integration are required at all levels.

5. Mass awareness in the society regarding health status of women should be created.

6. There should be a complete ban on teenage marriages.

5.4 RECOMMENDATIONS

1. A similar study on a larger sample and for a longer duration may be conducted and hence the findings may be generalised.

2. The study can be conducted in different settings to strengthen the findings.

3. A comparative study to find out the effect of health education between two social strata among the mothers attending antenatal clinic at private and corporation hospitals.
4. A study can be done on the knowledge, practices and attitudes of women towards cooking practices.

5. A study to find out effect of health education on knowledge and practices of women towards health practices such as hand washing can be done.

6. A study can be done on the knowledge and practices of women towards eating non-food items during pregnancy.

7. A study to find out knowledge and practices of women towards using mishri during antenatal period can be undertaken.

8. A study to assess the knowledge of mothers towards types of anaemia during pregnancy can be done.

9. A study to assess the knowledge, practices and attitude of women towards consumption of food during pregnancy can be done.

10. A study to find out knowledge, practices and attitude of women towards consumption of supplementary drugs during pregnancy can be done.

11. A study to assess of dietary patterns of women of different socio-economic strata during pregnancy can be undertaken.

12. A study can be done to find effect of reproductive health services provided to women.

13. A study can be done on effect of supplementary drugs provided during pregnancy.

14. A study can be done to find out the role played by a nurse in antenatal clinic and in home in relation to pregnant women.

15. A comparative study to find out the effectiveness of health education between illiterate and educated pregnant women can be done.

16. A comparative study to find out the effectiveness of health education between primi and multi para women in relation to anaemia can be done.

17. A comparative study to find out the effectiveness of health education between working and non-working pregnant women towards anaemia can be undertaken.

A woman's access to health services is vital. Because a woman has the responsibility of caring for the health of her entire family, her knowledge regarding health is important, both for herself and the health of her family. Though policies are present that aim to increase woman's access to better health care and even though almost 75 percent of our health system workers are women; women have no decisive