
Objective: The objective was to determine association of maternal education, gestational age, parity and socioeconomic status with nutritional knowledge and subsequent practice regarding iron rich foods and iron supplements.

Study Design: Knowledge, attitude and practice (KAP study).

Place and Duration of study: The study was carry out at the Gynaecology and obstetrics Out patient department of Federal Government Services Hospital Islamabad from December 2010 to February 2011.

Materials and Methods: A sample of 400 pregnant women was selected using consecutive sampling technique. Pregnant women taking only iron supplement with no other complaints other than anemia, were included in the study. With the help of pre coded and pre tested questionnaire data were collected. Statistical tests like chi-square, ANOVA and Standard multiple regression were applied to determine correlation between independent variables (education, socioeconomic status, parity and gestational age) and dependent variables (knowledge and practice of iron rich foods and iron supplements).

Results: A significant relationship (p<0.001) was observed between nutritional awareness and educational status of the respondents. However, the practice was solely dependent on monthly income (p<0.001), irrespective of the awareness. Parity and gestational age bore no relationship with nutritional knowledge and practices. Knowledge regarding the benefits of supplements was also significantly related to the educational status of the women (P<0.001).

Conclusion: There is an urgent need to boost maternal awareness regarding nutrition before, during and after pregnancy.

Key words: Pregnant Women, Knowledge, Anemia.

Introduction

The nutritional status of the expectant mother is the most important determinant of pregnancy outcomes, including the birth weight of the newborn.¹ In developing countries, maternal under nutrition is a significant cause of maternal mortality, low birth weight and stillbirth.² Data from National Nutrition Survey, 2001-2002 revealed that anemia, especially iron deficiency remains a major problem, 45% of women suffer from iron deficiency anemia during pregnancy.³ However, most studies have confirmed that more than 80% of cases of anemia in women especially during pregnancy are associated with iron deficiency.⁴ Health care professionals in Pakistan commonly observe that women eat less during pregnancy to prevent difficulty in delivery. Iron supplements are also considered to be hot and overall 25% of women take iron supplements and usually do not start taking them until sixth month of gestation.⁵ This finding is consistent with patterns of household consumption in several other countries, where men are given more food than women due to women’s lower status and as a belief that men need more food because they work harder.⁶ Iron Deficiency Anemia (IDA) affects one billion people worldwide and the United Nations Children’s Fund’s (UNICEF) emphasizes this global problem and goal to reduce the prevalence of anemia (including iron deficiency) to one third by 2010.⁶ Evaluation of eating habits of pregnant women allows the early detection of specific nutritional problems, which can be corrected,
avoiding harm during pregnancy. Keeping all these facts in mind, this study was designed to determine the impact of education, socioeconomic status, gestational age and parity on maternal knowledge, attitude and practices regarding iron rich foods and supplements.

**Materials and Methods**

It was a KAP study carried out at the gynaecology OPD of Federal Government Services Hospital (FGSH) Islamabad after the fulfillment of ethical requirements. Study population was composed of pregnant women attending the antenatal clinic between December 2008 to February 2009. A sample of 400 pregnant was selected using consecutive sampling technique. Pregnant women only taking iron supplements with no physical illness other than anemia were included in the study. This criterion was based on haemoglobin value of 11g/dl for pregnant women specified by WHO. A pre-tested questionnaire was used to identify socioeconomic and demographic data including the following variables: age, schooling, husband’s education, family income, gestational age and number of living children.

Question to assess knowledge and awareness of the subjects regarding anemia, its aetiology and the prevention of the problem were included in the questionnaire. For data analysis purposes, the respondents were divided into two categories: respondents who could identify the correct option and those who exhibited insufficient knowledge by choosing the option of don’t know. The association was seen between knowledge and educational status. Respondents were evaluated for their level of awareness regarding iron rich foods and iron supplements. Questions regarding the usage, source of information and benefits associated with iron supplements were included in the questionnaire. List of food items was provided to select iron rich foods as well as to identify the enhancers and inhibitors of iron absorption.

Eating habits were evaluated through a semi-quantitative Food Frequency Questionnaire (FFQ) that included six iron rich foods in which frequency was characterized as once a week, 2, 3, 4, 5-6 times, daily or never consumed. The study evaluated the consumption of five food items, natural iron sources of animal origin (beef, liver, mutton, poultry, and eggs) and vegetable origin (green leafy vegetables) in accordance with National Nutritional Survey of Pakistan 2001-2002. Statistical analysis was done using SPSS version 13. Chi square test was employed for the understanding of association between knowledge and practices as well as the association between independent variables (Education, Socioeconomic status, Parity, Gestational age) and dependent variables (Nutritional knowledge and eating practices). The value of P<0.05 was considered to be statistically significant.

**Results**

44% of women were in the age group of 21-25 years. 22% of the subjects were illiterate with 7.3% of the husbands being illiterate. While 25% of the respondents had passed the tenth grade. The highest level of education was masters completed by 12% of the respondents in the sample under study. 45% of the respondents had a monthly income of 5-10 thousand while 38% earned between 10-20 thousand rupees per month. Only 17% were earning more than 20 thousand rupees monthly. Most of the women attending the clinic were in their last trimester. 29% of the respondents were experiencing pregnancy for the first time, 18% had one and 22% had two children.

In terms of knowledge about anemia most of the respondents (66%) had heard about anemia as a health problem and 34% were not aware of the condition. When the respondents were asked about the causes of anemia, 42% could not identify any of the causes. Pregnancy itself was the most commonly identified cause by 36% of the respondents. Only 22% attributed it to the lack of iron-rich foods in the diet. It was evident that as the level of education increased, awareness regarding the causes also increased (P<.001). Overall knowledge regarding iron rich foods was low. Only 24% were aware of beef and similar percentage knew about green leafy vegetable as a rich source of iron. 18% did not have knowledge regarding any of the iron rich foods. (Figure 1). However, a significant relationship (P < .001) between educational status and knowledge regarding iron rich foods was noticed. Higher level of knowledge was observed in subjects with higher educational background compared to illiterate women regarding iron rich foods (Table I). More than half (51%) of the respondents had no knowledge about the positive effect of Vitamin C on iron absorption. Although knowledge was poor but it was significantly related to the educational level.(p<.003)

![Figure 1. knowledge regarding iron rich foods](image-url)

*DGLV=daily green leafy vegetables*
*Overall knowledge regarding iron rich foods was low. 47% knew about iron rich source of liver and 33% about mutton, 35% about chicken. Only 24% were aware of beef and similar percentage knew about green leafy vegetable as a rich source of iron. 18% did not have knowledge regarding any of the iron rich foods. (Figure: 1).

Food frequency questionnaire revealed that the consumption of chicken was relatively higher as compared to other meats. 36% and 34% of mothers reported not eating mutton and beef in a week respectively. The consumption of DGLV was low, only 19% consumed once a week. A large percentage (45%) never consumed liver. Overall the consumption of foods rich in iron was found to be low. No significant relationship (p>0.001) between knowledge regarding iron rich food and the subsequent practices was observed. Income was found to have profound effect on the practices of the respondents. However, the practice was solely dependent on monthly income (P<.001)

Majority of the respondents had awareness regarding iron supplements and only 16% had never heard of them. 64% of the respondents were actually using iron supplements while 56% were using regularly. Most commonly reported reason for not utilizing iron rich foods (p<.001), while education (p>.05), parity (p>.05) and gestational age (p>.05) were not significantly related to the practices.

Table I: Cross tabulation (and chi square test) between knowledge regarding foods rich in iron and educational level.

<table>
<thead>
<tr>
<th>Food Items</th>
<th>Illiterate</th>
<th>Middle</th>
<th>Matric</th>
<th>Intermediate</th>
<th>Graduate and above</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>39 (44%)</td>
<td>37 (41%)</td>
<td>36 (35%)</td>
<td>32 (56%)</td>
<td>42 (68%)</td>
<td>.001</td>
</tr>
<tr>
<td>Mutton</td>
<td>13 (15%)</td>
<td>23 (25%)</td>
<td>31 (30%)</td>
<td>24 (42%)</td>
<td>40 (65%)</td>
<td>.000</td>
</tr>
<tr>
<td>Beef</td>
<td>12 (14%)</td>
<td>19 (21%)</td>
<td>13 (13%)</td>
<td>18 (32%)</td>
<td>35 (57%)</td>
<td>.000</td>
</tr>
<tr>
<td>Chicken</td>
<td>17 (19%)</td>
<td>26 (29%)</td>
<td>31 (30%)</td>
<td>26 (46%)</td>
<td>41 (66%)</td>
<td>.000</td>
</tr>
<tr>
<td>Egg</td>
<td>23 (26%)</td>
<td>36 (40%)</td>
<td>31 (30%)</td>
<td>27 (47%)</td>
<td>39 (61%)</td>
<td>.000</td>
</tr>
<tr>
<td>DGLV</td>
<td>6 (7%)</td>
<td>17 (19%)</td>
<td>15 (15%)</td>
<td>20 (35%)</td>
<td>36 (58%)</td>
<td>.000</td>
</tr>
</tbody>
</table>

Food frequency questionnaire revealed that the consumption of chicken was relatively higher as compared to other meats. 36% and 34% of mothers reported not eating mutton and beef in a week respectively. The consumption of DGLV was low, only 19% consumed once a week. A large percentage (45%) never consumed liver. Overall the consumption of foods rich in iron was found to be low. No significant relationship (p>0.001) between knowledge regarding iron rich food and the subsequent practices was observed. Income was found to have profound effect on the practices of the respondents. However, the practice was solely dependent on monthly income (P<.001).

Majority of the respondents had awareness regarding iron supplements and only 16% had never heard of them. 64% of the respondents were actually using iron supplements while 56% were using regularly. Most commonly reported reason for not utilizing iron rich foods was their side effects and perception that supplements have no benefits.

There was no significant relationship between the educational level and awareness about iron supplements (P=1.95) as well as the use of iron supplements (P> .799). But regarding the benefit that "iron supplements increase blood", the relationship between knowledge and educational status was found to be significant (P<.001).

To sum up, education had a profound impact on the level of awareness of the respondents (p< .001), regarding anemia, its causes and prevention as well as iron rich foods and the benefits provided by the supplements. A highly significant relationship was observed between monthly income and practice of utilizing iron rich foods (p<.001), while education (p>.05), parity (p>.05) and gestational age (p>.05) were not significantly related to the practices.

![Figure 2: Practice regarding Iron Rich foods](image-url)
Food frequency questionnaire revealed that the consumption of chicken was relatively higher as compared to other meats. 36% and 34% of mothers reported not eating mutton and beef in a week respectively. The consumption of DGLV was low, only 19% consumed once a week. A large percentage 45% was not taking liver. Overall the consumption of foods rich in iron was found to be low. No Significant relationship (p>0.001) between knowledge regarding iron rich food and the subsequent practices was observed.

Discussion

The study has highlighted a good level of awareness regarding the term “anemia” but poor knowledge about its causes and prevention. A study carried out in a peri urban village of Chandigarh showed most women had poor knowledge about anemia despite of the fact that all women had been beneficiaries of anemia prophylaxis programme. Whereas those women who were exposed to nutritional education were much better at identifying causes and preventive measures of anemia. Even in the present study a positive correlation was observed between awareness regarding the causes of anemia and educational status (P<.001).

As many as 70% of the respondents had the knowledge that they should eat differently from non pregnant women. Here the knowledge was independent of educational status, even the illiterate mothers were well aware of this fact. But when the practices were studied, it was seen that only 32% had actually enhanced their diet. It has been shown by a study that despite having knowledge, pregnant women do not pay particular attention to their diet and hardly change their eating habits. In our study the knowledge of iron rich foods was poor. Higher level of knowledge was observed in subjects with higher educational background (p< .001). A study carried out in India to see the effect of education on knowledge, attitude and practice of pregnant women showed that 93% of the educated women were in favor of including iron rich foods in their diet as compared to 67% in the group with no education (p< 0.001). Education has a pivotal role in reducing micronutrient deficiencies and research has shown that maternal education can increase iron intake and ultimately rectify iron deficiency. Food frequency questionnaire in our study revealed that the consumption of foods rich in iron was far below the required level. Study on dietary pattern have indicated poor consumption of milk, liver and leafy vegetables during pregnancy. In the present study almost half of the respondents were not utilizing iron rich foods once a week and the practices were mainly influenced by socioeconomic status. In developing countries pregnancy-related undernutrition can be attributed to various socio-economical reasons and poor awareness of basic nutritional requirements. A study carried to estimate the burden of anemia in Jat women revealed that daily intake of fruits, vegetables, milk and milk products was below the recommended level in both the rural as well as urban women. In our study knowledge of iron rich foods bore no correlation to subsequent action. Respondents with knowledge about the iron content of mutton, beef, chicken, green vegetables, showed restricted consumption. Two key factors emerged for not translating knowledge into action, firstly the financial constraints and secondly the digestive problems faced by women during pregnancy. On the contrary, a study conducted in Japan found that higher education was associated with higher intakes of iron. The study conducted to determine women’s perception of iron deficiency and anemia prevention in eight developing countries showed that in Pakistan lack of available meat and competition for inadequate amounts of iron rich foods with husbands and children were cited as the major causes of anemia.

A vast majority of the subjects were aware of iron supplements and were consuming them regularly as prescribed irrespective of educational status. On the contrary study carried out in Malaysia showed that education was positively associated with vitamin/mineral supplementation. The knowledge about the benefits of supplements was higher in educated group as compared to illiterate group (p< 0.001). The is supported by the study which showed that women attending the antenatal clinics were capable of recognizing iron tablets and took them as prescribed but were not aware why they were prescribed. The main informational source was doctor and gastrointestinal side effects were the main reasons for discontinuing the supplements. A statistical report of WHO has shown the despite iron supplementation, anemia has remained a significant nutritional problem among pregnant women in developing world and one of the reasons include gastrointestinal side effects. Study conducted in Urmia, North West of Iran highlighted that 30% of the subjects experienced side effects, while main source of information was lady health worker for 67% of the respondents. Contrary to our findings another study revealed that the major reason for discontinuing iron tablets was poor access to supplies (i.e., low utilization of antenatal care services or inadequate supplies at facilities). Other reasons included unappealing taste, side effects (e.g., gastrointestinal problems), and fear of difficult delivery.

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Conclusion

There is an urgent need of investment in women’s education as educated mothers exhibited sound nutritional knowledge. However, maternal awareness alone is not sufficient to impact practices and attitudes. Behavioral, physiological, and socioeconomic limitations must be addressed efficiently. Dissemination of comprehensive nutritional knowledge regarding diet and supplements should be made an integral component of antenatal visits. Through effective nutritional intervention women should be informed regarding the purpose and benefits of the tablets to both mother and her unborn children and motivated to increase the consumption of iron rich foods and foods that favor the absorption, as well as cut down the consumption of foods that inhibit iron absorption.

References