

## **Nutritional Assessment of Selected Primigravidas (Women with First Pregnancy) Belonging to Low Socio Economic Status**

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### **Abstract**

The study was conducted to assess the nutritional status of selected primigravidas belonging to low socio economic status. Anthropometric measurements (weight and height), dietary, laboratory and clinical assessment was carried out. 40 primigravidas were selected through purposive sampling technique. 24-hour recall and food frequency method was used to determine food choices and current nutritional status. The 24-hour recall data revealed the actual calorie intake of the primigravidas, and portion of macronutrients (Carbohydrate, protein and fat) and micronutrients (calcium and iron) contributing to daily dietary composition.

Almost half of the pregnant women (50%) were consuming protein 50 g/day which is less than recommended value i.e (71 g/day), similarly majority of pregnant women (50%) consumed fat 45 g/day which is less than standard value i.e (67g/day). Carbohydrate(simple) intake showed exceeding level i/e more than 200 g per day in most of the samples. Total caloric (1st semester 1467 kcal/day, 2nd trimester 1306 kcal/day and 3rd trimester 1267 kcal/day intake of most of the primigravidas were low as compared to their recommended dietary allowances.

Micronutrient requirements i.e calcium (744 mg/day) and iron (12 mg/day) intake of most of the primigravidas were low as compared to their recommended dietary allowances.

Majority of women had normal BMI level, normal blood pressure, normal sugar level but majority of them had low hemoglobin content and were moderate anemic.

Food choices and eating practices varied due to low socio economic status. Most of the women did not took appropriate amount of meals and had bad habit of skipping meals at twice a week. Although food choices were not very wise, supplements like iron and calcium were which are necessary were not consumed by majority of pregnant women. Counseling was done regarding benefits of balanced meal during Pregnancy.

**Keywords:** *Primigravidas; Anthropometric Measurements; Nutritional Assessment; Food Frequency; 24-Hour Recall.*

**Abbreviations:** BMI: Basal Metabolic Index

### **Introduction**

The effect of nutrition extends over years in every life cycle. A woman's nutrition before and throughout the pregnancy affects not only her own health but also the growth, development and health of her child, even after the child has been born so sound nutrition is vital to healthy infant development.

Pregnancy is the period of dynamic change for a mother who requires a lot of care. During this period the fetus is nourished directly by the mother through placenta, the baby totally relies upon its mother for nourishment so the pregnant woman is to be provided with an adequate and well balanced diet [1].

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Primigravidas requires good nutrition to ensure good maternal health and reduce the risk of birth defects, suboptimal fetal growth and development as well as chronic health problems in their children. Monitoring gestational nutritional status by taking anthropometric measurements is a promising means of optimizing fetal growth. It is well known that nutritional intervention focused on woman's health during the reproductive stage, not only in the preconception period but also during the prenatal period, helps achieve adequate newborn nutritional status and is reflected in childhood health and nutritional conditions [2].

Eating a healthy diet, balancing carbohydrates, fat, and proteins, and eating a variety of food from following group i.e cereals, milk, cheese, meat, fish, poultry fruits and vegetables, usually ensures good nutrition and provides all the vitamins and minerals needed during pregnancy, enough energy will be provided by consuming ample amount of these nutrients and hence mothers body will be in proper function.

Other than nutrition several other factors should be considered which include personal hygiene, active life style, and regular exercise to avoid complications during pregnancy and to bear normal healthy infant.

The field of nutrition of pregnant women in low socio economic group is sadly a much-neglected area of research, especially in Pakistan. There is a dearth of literature on health and nutrition of pregnant women in low socio economic group in Pakistan. Hence, the present study is undertaken to know the health and nutrition status of pregnant women belonging to low socio economic group status.

The study will help to understand the prevailing dietary practices in low socio economic level and will help women to develop an understanding about the importance of healthy food practices during pregnancy hence protecting themselves from the hazards of poor nutrition, so the baby is born healthy and mother health is also not adversely effected.

### Methodology

It was a survey study. The purpose of the study was to find out the current nutritional status and dietary intake of the selected primigravidas (woman with first pregnancy).

### Population

The universe of the study were the Primigravidas belonging to Low Socio Economic Status.

### Sample Size

40 Primigravidas of income level less than Rs. 15,000 were selected through purposive sampling method (a sampling technique in which the researcher chooses the sample based on who they think would be appropriate for the study).

### Data Collection Method

Interview schedule was structured in order to assess the daily and weekly consumption of food products that they eat. Questions were asked for the basic information about their age, education, occupation, income level and medical history from the selected sample to assess their awareness.

### Tools for Data Collection

Tools which were used to collect data were Diet History, 24-hour recall method, Food frequency, Anthropometric measurements (weight and height), BMI (Basal Metabolic Index), Clinical Assessment, Biochemical Test (Hemoglobin level, blood sugar level and blood pressure level).

### Anthropometric Measurements

#### Height & Weight

Height and weight of the patient was taken at the time of data collection which was important to assess the BMI. Height was measured in inches with the help of stadiometer and weight was taken in Kg with the help of weighing scale.

## **BMI**

BMI was calculated to assess the weight status of the females. It measures the weight in relation to height. The formula of BMI is body weight in kilograms divided by the height in meters squared.

## **Clinical Assessment**

Clinical sign and symptoms related to pregnancy were observed. Signs related to skin, hair, face eyes, lips, tongue, gums and nails were observed and some complications faced by the women during pregnancy were also observed which are blood pressure, anemia, high blood sugar level, constipation, nausea, edema, joint pains and headaches.

## **Biochemical Analysis**

The result of biochemical parameter noted from patients medical report included Blood sugar level, Hemoglobin level, Blood pressure.

## **Diet History**

The diet history usually begins with a face-to-face interview to determine the usual meal pattern, most frequently from a 24hr recall method. The next step was a food frequency questionnaire checklist to assess the weekly caloric, macro and micronutrient consumption of primigravidas.

## **24-Hour Recall**

24-hour recall method was used for taking diet history of the patient. The respondents were questioned for assessment of their daily consumption of food they eat for past three days. The quantities were then compared with the recommendations.

## **Food Frequency List**

Food frequency list were used to assess the weekly consumption of the primigravidas. A list was formulated encompassing all the food groups. With the help of food frequency list, the frequency of the consumption of the listed food items is recorded.

## **Data Analysis**

The data collected was statistically analyzed by using SPSS software version. MS word was used to tabulate the results.

## **Results**

For the collection of data, the first step was to construct an instrument for this purpose a questionnaire was developed, the questionnaire was sub divided covering different nutritional issues related to pregnancy, responses were collected on various point scales, both close and open ended questions were present. Exchange list was used for identifying exchange of calories, carbohydrate, protein, fat, calcium and iron.

Data gathered were input into SPSS version 20.0 and analyzed using this software. Categorical variables were expressed by percentage in graph form, t-test was applied on questions like total calories, carbohydrates, protein, fat, calcium and iron content where comparison with standard value was required. Paired samples t-test was applied on current weight and pre-pregnancy weight for comparison with each other. A p-value of less than 0.05 was judged to be statistically significant.

## **Demographic Characteristics of the Study Sample**

My study population reveals (50%) of the pregnant women belonged to services hospital and (50%) of the pregnant women belonged Lady Aitcheson hospital. Family size ranging between 1 - 12, education status of wife ranged between illiterate to above Matric which shows that 17.5% belonged to illiterate group, 10% belonged to primary group, 15% belonged to middle group, 37.5% belonged to Matric and rest that is 20 belonged to group above Matric. Income ranges of selected sample were between 1000 - 15000, 10% had it between 1000 - 5000, that of 50% was between 6000-10000, 40% had it between 11000 - 15000. Money spent on food ranged between 30 - 70%,

37.5% spent 30% of their total income on food, 55% spent 50% of their total income on food, 7.5% spent 70% of their total income on food. It was seen that 97.5% of the selected sample were housewives while 2.5% was working women. 10% of the selected sample fall in category of first trimester, 42.5% in second trimester and 47.5% in third trimester.

**Medical profile of the participants**

7.5% of pregnant women had low blood pressure fall in a range between systolic < 120 mm/Hg diastolic < 80 mm/Hg, 82.5% had normal blood pressure fall in a range between systolic 130 mm/Hg diastolic 85 mm/Hg and 10% had high blood pressure according to range systolic 130 - 139 mm/Hg and diastolic 85 - 95 mm/Hg.

5% of the pregnant women had low blood sugar level that fall in range of < 70 mg/dL, 87.5% had normal blood sugar level that fall in range between 120 - 140 mg/dL and 7.5% had high blood sugar level that fall in range > 140 mg/dL.

10% of pregnant women had hemoglobin level ranged between 7 - 8.9 that shows that they had low hemoglobin level and fall in class of moderate anemia, 82.5% had hemoglobin level of 9 - 10.9 that also shows low level of hemoglobin and they also fall in category of moderate anemia, and 7.5% had hemoglobin ranged between 11-12.9 which appeared to be normal.

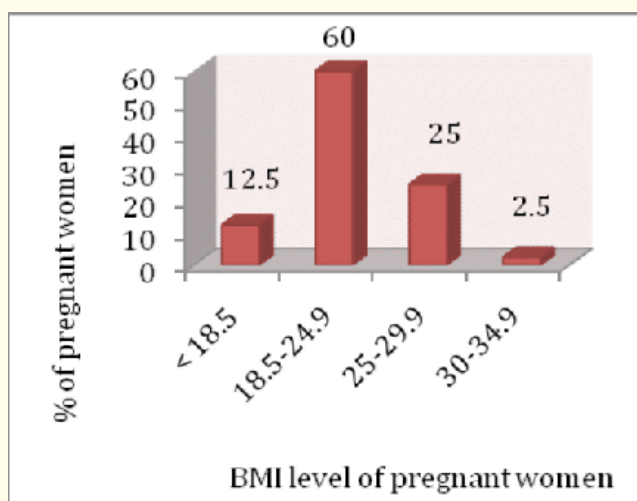
**Clinical Assessment**

Clinical signs were observed in samples which showed 22.5% of pregnant women had pale skin colour while 77.5% of pregnant women had normal colored skin, 22.5% had pale face while remaining 77.5% had normal face and none of them had Scaling around nose, swollen (Edema), 2.5% had pale eyes while remaining 97.5% had normal eyes and none of them had dry and scaly eyes 5% had pale nails while 95% of had normal nails none of them had white spotted, brittle, ridged, spoon shaped nails.

7.5% of pregnant women had thin hair, 2.5% was having brown streaks, 15% complained that their hair got easily plucked out, 75% had normal hair and none of them complained about having dry hair.

32.5% of selected sample of pregnant women had cracked lips, 67.5% had normal lips and none of them had erosions at the angles of mouth, swollen and Puffy lips. 40% of pregnant women had bleeding gums, 60% had normal gums and none of them had swollen gums. 7.5% of selected sample of pregnant women had coated tongue, 92.5% had normal tongue and none of them had wavy edges, scarlet red, pale tongue.

**Nutritional Evaluation**



**Figure 1:** BMI of pregnant women.

According to graph, 12.5% of pregnant women fall in category of less than 18 which means pregnant women were underweight, 60% fall in category of 18.5 - 24.9 which means pregnant women lied in normal BMI level and had normal weight, 25% fall in category of 25 - 24.9 which means pregnant women were overweight and 2.5% fall in category of 30 - 34.9 which means pregnant woman was first class obese.

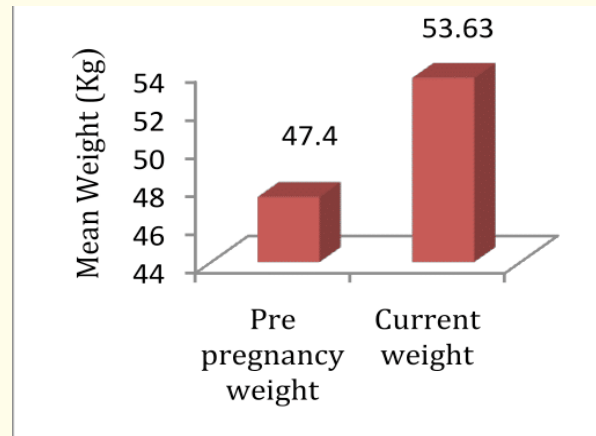


Figure 2: Comparison of pre pregnancy and weight during pregnancy.

Above Graph shows results of paired sample test. Paired sample test was applied to compare pre-pregnancy weight with current weight (weight during pregnancy). The value of p is less than  $\alpha$  (0.05), so there is a significant difference between pre-pregnancy and current weight. Mean of pre-pregnancy weight is 47.40 and mean of current weight is 53.63 which means there is a difference of 6 kg between pre-pregnancy and current weight of pregnant women.

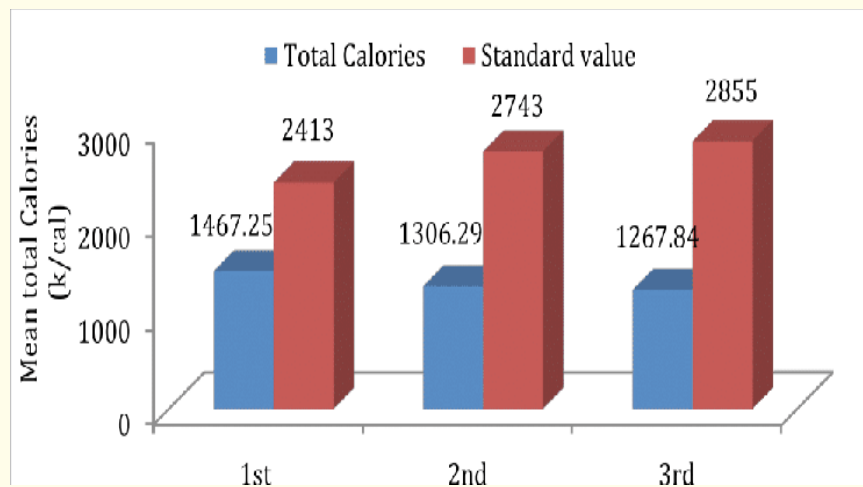


Figure 3: Comparison of average intake of calories by recommended dietary allowances during pregnancy.

Graph shows results of one sample t-test. One sample t-test was applied to compare current caloric intake with standard value of calories in each trimester. The value of p in each trimester is less than  $\alpha$  (0.05), there is a significant difference between observed total caloric content from standard value in each trimester. Mean of caloric content in first trimester is 1467 k/cal that is less than standard value i.e 2413 k/cal, in second trimester 1306 k/cal that is less than standard value that is 2743 k/cal and in third trimester 1267 k/cal that is less than standard value 2855 k/cal.

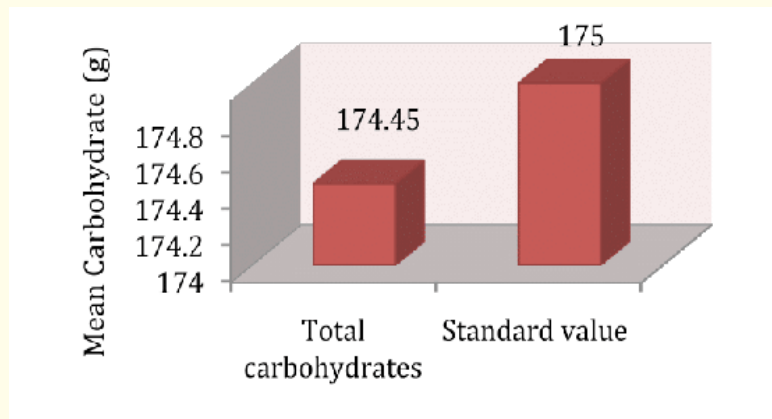


Figure 4: Comparison of average intake of Carbohydrates by recommended dietary allowances during pregnancy.

According to graph, mean of total carbohydrate is 174.45 and there was no significance difference observed in total carbohydrate content and standard value.

Comparison of current intake of protein content of pregnant women by recommended dietary allowances during pregnancy.

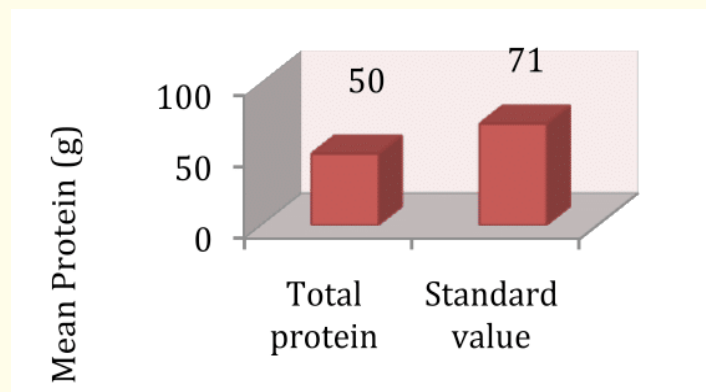
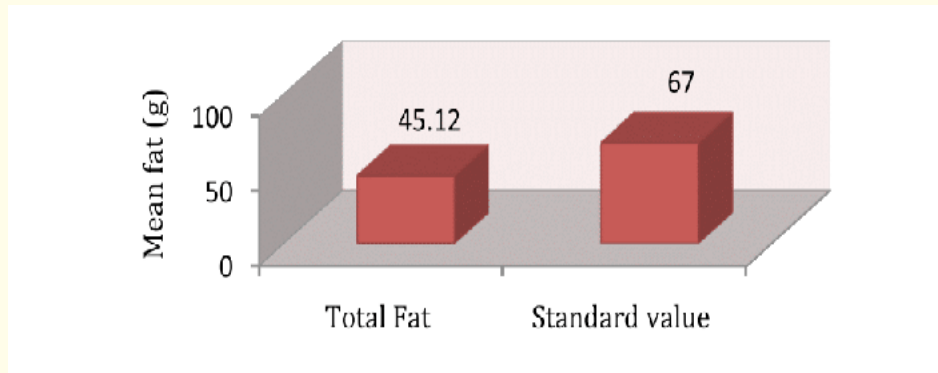


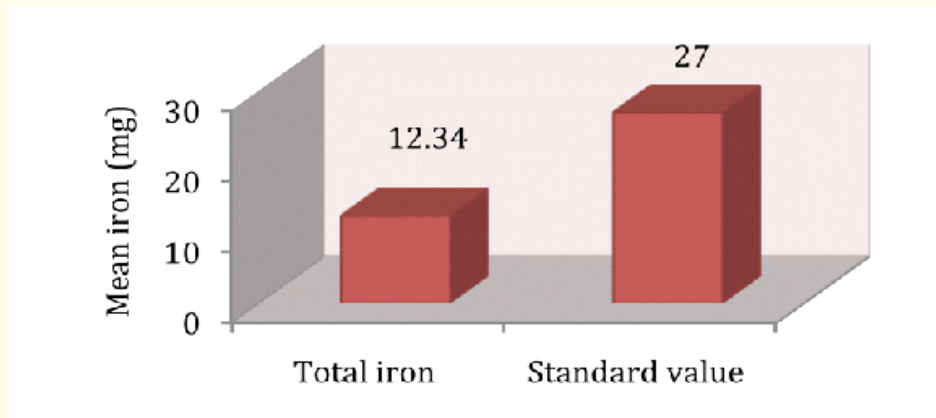
Figure 5: Comparison of average intake of Protein by recommended dietary allowances during pregnancy.

Graph shows results of one sample t-test. One sample t-test was applied to compare current protein intake with standard value of protein. The value of p is less than  $\alpha$  (0.05), there is a significant difference between observed total protein content from standard value. Mean of protein content is 50g which is less as compared to standard value which is 71g.



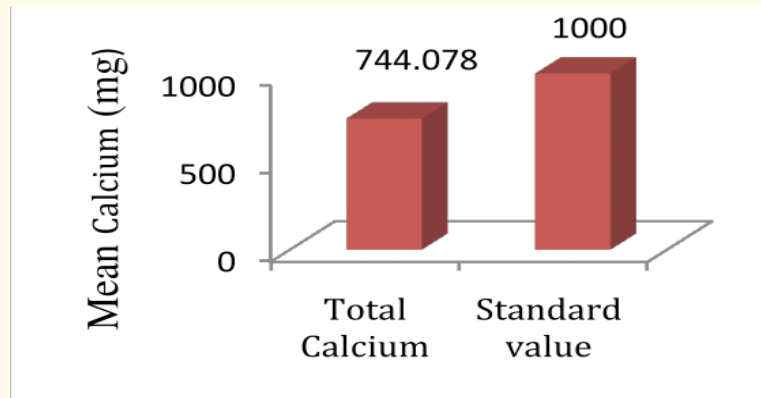
**Figure 6:** Comparison of average intake of fat by recommended dietary allowances during pregnancy.

Graph shows results of one sample t-test. One sample t-test was applied to compare current fat intake with standard value of fat. The value of p is less than  $\alpha$  (0.05), there is a significant difference between observed total fat content and standard value. Mean of protein content is 45g which is less as compared to standard value which is 67g.



**Figure 7:** Comparison of current intake of iron content of pregnant women by recommended dietary allowances.

Graph shows results of one sample t-test. One sample t-test was applied to compare current iron intake with standard value of iron. The value of p is less than  $\alpha$  (0.05), there is a significant difference between observed total iron content from standard value. Mean of iron content is 12.34 mg which is less as compared to standard value that is 27 mg.



**Figure 8:** Comparison of current intake of calcium content of pregnant women by recommended dietary allowances during pregnancy.

Graph shows results of one sample t-test. One sample t-test was applied to compare current calcium intake with standard value of calcium. The value of p is less than  $\alpha$  (0.05), there is a significant difference between observed total calcium content from standard value. Mean of calcium content is 744 mg which is less as compared to standard value that is 1000 mg.

**Food Frequency**

Food Frequency check list was used as a tool for dietary assessment of selected sample which showed that 42.5% of pregnant woman never consumed egg on daily basis while 7% did consume egg daily, 62.5% pregnant women did not consume mutton at all on daily basis, 45% of pregnant women did not consumed chicken on daily basis while 2.5% of them did consume chicken on daily basis, 75% pregnant women did not consume beef on regular basis, only 2.5% of pregnant women did consume fish on daily basis, 12.5% of pregnant women did not consumed pulses on daily basis while 2.5% of them did consume pulses each day.

70% pregnant women consumed milk on daily basis while 10% of them never consumed milk on daily basis, 37.5% pregnant women consumed yoghurt daily while 30% of pregnant women did not consumed yoghurt on daily basis and 37.5% of pregnant women consumed Lassi on daily basis while 30% of them never consumed Lassi (Buttermilk).

Only 12.5% pregnant women consumed vegetables daily while only 2.5 % did not consumed vegetables at all, 7.5% of the pregnant women consumed potatoes every day while 15% of them never consumed potatoes regularly, 30% of the pregnant women consumed fruits on daily basis while 17.5% of them never consumed fruits, 7% of pregnant women consumed fruit juices every day while 55% of them never consumed fruit juices.

Majority of pregnant women that is 97.5 by percentage consumed chapati daily, 7.5% of the pregnant women consumed bread daily while 47.5% of them never consumed bread, 45% of the pregnant women consumed rice daily while rest of them did not consumed rice on daily basis, none of the pregnant women consumed paratha on daily basis, similarly none of the pregnant women consumed rusk on daily basis, none of the pregnant women consumed porridge on daily basis too.

Only 10% of the pregnant women consumed butter on daily basis while 62.5% of them never consumed butter, 5% of the pregnant women consumed cake on daily basis while 25% of them never consumed cake, none of the pregnant women consumed biscuits on daily basis, 10% of the participants consumed carbonated drinks daily while 27.5% of them never consumed, none of the pregnant women consumed sweets/chocolate on daily basis.

Imbalance of nutrient intake can be seen from above discussion and the main reason for that is low socio economic status of selected samples.



## Discussion

Many studies pointed to the high incidence of poor nutritional status among primigravidas. The total caloric cost of producing the fetus, the placenta, and other maternal tissues and of establishing reserves is about 80,000 kcal which make an extra allowances of 300 kcal per day for satisfactory weight gain and optimal nutritional status to bear pregnancy and healthy infant. An allowance of at least 36 kcal per kg pregnant weight is needed for satisfactory utilization of protein, with 40 kcal per kg being an average intake.

The present study was conducted to find out the nutritional status of selected primigravidas belonging to low socio economic status.

Most of the pregnant women had no allergy to any kind of food. Majority of sample had habit of skipping meals, most of the pregnant women did not consumed any kind of supplements (calcium, iron, folic acid and multivitamins) majority of pregnant women were consuming 14 glasses of water daily.

The 24 hr recall data did not support high caloric intake even by overweight women. Average intake of majority of samples was less than recommended dietary allowances. Macronutrient consumption (protein and fat) was low less than standard value except for carbohydrate (simple) which was found to be high among the pregnant. Micronutrients (iron & calcium) consumption was less than standard values.

So, according to these findings pregnant women were consuming fewer calories, protein, fat, calcium and iron and on the other hand they were consuming a greater amount of carbohydrate than their recommended dietary allowances These findings depict imbalance and excessive intake of carbohydrates in many of the selected sample.

The daily intake of body building foods, rich in protein like meat, fish and egg (reference protein) were low among respondents, none of them consumed egg, mutton, chicken, beef and fish on regular basis. Pulses were consumed on daily basis along with chapati (roti) and rice, milk was also consumed by pregnant women on daily basis.

The daily intake of vegetables were also high, the frequency of pregnant women who took fruits on a daily bases were comparatively low from vegetables which is not encouraging, majority of pregnant woman had liking for carbonated drinks and were not very fond of sweet products like cake and biscuits.

Snacks consumption pattern varied too mostly the pregnant women did not consumed snacks like samosa, rolls, chips, biscuits, nimko, french fries, dahi bhally and channa chat.

It was concluded that majority of pregnant women had normal BMI level, and had gained weight upto 6 kg which is low according to recommended weight gain during pregnancy. Biochemical findings i.e blood pressure, blood sugar level were normal except from hemoglobin content which was low and pregnant women were moderate anemic.

Clinical assessment revealed that almost majority of pregnant women had normal skin, color, face, hair, eyes, lips, tongue, gums and nails.

Most of the pregnant women complained about vomiting, nausea, heart burn, edema, mood swings, dizziness, headache, constipation, joint pain and how they get easily exhausted.

The study showed that proper nutritional status prior and during pregnancy is the most important factor to bear healthy and normal infant. The determinants of food variety and dietary diversity in this population are the level of maternal education, maternal income and the number of other factors like environmental factors and their life style factors. These factors all have an effect on household food security and thus the challenge of how to promote increased dietary diversity in pregnant women, belonging to low socioeconomic status especially in Pakistan remains a challenge.

Another challenge is the high prevalence of illiteracy and other factors like socio economic factors, cultural Practices, birth spacing, food preparation, care given to pregnant mother during pregnancy, since these behavioral factors seem to have a mediating effect on the relationship between dietary intake and the birth outcome.

Other than nutrition several other factors should be considered which include personal hygiene, active life style, and regular exercise to avoid complications during pregnancy and to bear normal healthy infant.

### Conclusion

This study was the first one which was done to evaluate the nutritional status of primigravidas belonging to low socio economic status in Pakistan. Our study demonstrates the current nutritional status of pregnant women as well their prevailing dietary practices during pregnancy. The use of nutritional assessment tools showed a clinical as well as nutritional status of samples and showed that every pregnant women belonging to any socio economic class needs to be seen by registered dietitian, to help in providing an intensive nutritional counseling to bear healthy pregnancy.

### Acknowledgement

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