

Nutritional Assessment of General Population of Faisalabad; Pakistan

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Abstract

Objective: The aim of this study is to assess the nutritional status of general population living in Faisalabad and to determine the association between dietary intake and iron deficiency anemia. **Subjects and Methods:** A cross-sectional survey was conducted in Faisalabad on 216 subjects (11–35 years of age) and subjects were selected using simple random sampling living in during the study. So far the methodology on the basis of the hypothesis of Z-test I have arrived at the conclusion at confidence interval 98% following results were found. **Results:** Nearly 38.43% of the participants had anemia, among them 21.76% of the participants had mild anemia, 15.74% of the participants had moderate anemia and 0.93% of the participants had severe anemia. The 34.25% of participants were underweight and 9.7% of participants were overweight. More than 55% of females were suffering from anemia. **Conclusion:** Most of the female participants had anemia. There was a significant association between the intake of meat and hemoglobin level. Hence, special measures should be taken to provide dietary education, especially to females to have healthier mothers in the future.

Keywords: General population, iron deficiency anemia, nutritional status, underweight

INTRODUCTION

Despite the efforts of governments and nongovernmental organizations nutritional deficiencies and anemia remains a major public health problem, especially in people with low socioeconomic status.^[1] Anemia is usually defined as a decrease in the amount of red blood cells (RBCs) or hemoglobin (HB) in the blood.^[2]

Iron deficiency is thought to be the most common cause of anemia globally, but other nutritional deficiencies (including folate, Vitamin B12, and Vitamin A), acute and chronic inflammation, parasitic infections and inherited or acquired disorders that affect HB synthesis, RBC production or red cell survival, can all cause anemia. HB concentration alone cannot be used to diagnose iron deficiency. However, the prevalence of anemia is an important health indicator and when it is used with other measurements of iron status the HB concentration can provide information about the severity of iron deficiency.^[3-5]

Recently, there has been increasing interest from epidemiologists on the subject of economic inequality and its relation to the health

of populations. Socioeconomic status is an important source of health inequity, as there is a very robust positive correlation between socioeconomic status and health. This correlation suggests that it is not only the poor who tend to be sick when everyone else is healthy but also that there is a continual gradient, from the top to the bottom of the socioeconomic ladder, relating status to health. Moreover, different socioeconomic statuses have a strong relationship with different dietary intakes.^[6,7]

The present study was conducted as very little information about the nutritional status of general population in Faisalabad is known and recent studies in Faisalabad on nutritional assessment were mainly on pregnant women and were conducted in hospital setup; therefore, there was a dire need to have a study for nutritional assessment of general population to establish a basic information and data to enable government and nongovernmental organizations to formulate policies for

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the wellbeing of population of Faisalabad as this population forms a major contribution in the population of Pakistan.

SUBJECTS AND METHODS

The study was cross-sectional and descriptive, conducted in following areas of Faisalabad, this study was among the general population of which 108 were male and 108 were female (Age = 11–40 years) living in that area from January to March 2016.

The population was divided into three groups as follows: Group A <18 years, Group B >18 years, and Group C >30 years. The sample size was 216. All married, unmarried, healthy willing persons were included after getting consent forms filled by them. Study tool was the structured questionnaire. Confidentiality of all the data was ensured. Group A questionnaire was designed to see the status of nutrition and association of anemia.

Measuring tapes, weight machines and stationery were used for the collection of data. body mass index (BMI) was calculated using the formula weight/height (m²). Weight measured in kilograms and participant standing at the center of the scale and not holding anything, adjusting scale at zero. Measurement was taken from heel to knee, knee to hip, hip to shoulder, and shoulder to top of the head. BMI was calculated and categorized into four groups.

1. Underweight less than BMI of 19 kg/m²
2. Normal BMI of 19.8–24.9 kg/m²
3. Overweight BMI of 25–29.9 kg/m²
4. Obese BMI of more than 30 kg/m²

Food frequency questionnaire was filled by participants by recalling dietary intake in the past 1 week. Pilot testing of questionnaire was carried out and editing of questionnaire was done accordingly. Level of HB was checked by taking the blood samples of all the participants. Anemia was categorized by assessing the normal level of HB [Table 1].

RESULTS

The anemia was more prevalent in children, <18 years, as compared to peoples above 18 and middle age group people. The study sample was comprised of 216 participants. 108 were male and 108 were female out of those 216 total participants. The division of participants according to socioeconomic status was like, 46 in the upper class, 125 of the middle class and 45 lower class [Table 2].

There were more overweight participants in the upper class as compared to middle and lower class. Maximum number of underweight participants were in lower class. There was no obese participant in all the three socioeconomic classes [Table 2].

More peoples were affected with anemia in the lower class as compared to others. There were 62%, 43.6%, and 37% of people affected with anemia in lower, middle, and upper class, respectively [Table 3].

The frequency of anemia was far more in females than in males. More than half of the females were suffering from anemia [Table 4].

The intake of fruits, vegetables, milk, and eggs showed no association with the anemia, however, those participants who were taking milk, meat, fruits and vegetables were mostly having HB level in normal range.

Participants that were taking fats and oils >4 times/week were mostly overweight.

Moreover, none of the participant taking meat and meat products >4 times/week had anemia [Figure 1].

DISCUSSION

The observed association between child's age and anemia has been reported in several other studies worldwide, similarly nutritional anemia was more common in children under 18 years as compared to other two groups.^[8]

Table 1: Normal level of hemoglobin according to age

Age	Hb level (g/dL)
Females 12-18 years	12.0-16.0
Males 12-18 years	13.0-16.0
Female >18 years	12.1-15.1
Males >18 years	13.6-17.7
Middle age males	12.4-14.9
Middle age females	11.7-13.8

Hb: Hemoglobin

Table 2: Relationship of socioeconomic status with body mass index

	Underweight (%)	Normal (%)	Overweight (%)	Obese
Upper class (n=46)	6 (13.05)	28 (60.87)	12 (26.08)	Nil
Middle class (n=125)	46 (36.8)	70 (56)	9 (7.2)	Nil
Lower class (n=45)	22 (48.89)	23 (51.11)	Nil	Nil

Table 3: Relationship of anemia with socioeconomic status

	Mild (%)	Moderate (%)	Severe (%)	Normal (%)
Upper class (n=17/46; 37%)	7 (15.21)	10 (21.75)	Nil	29 (63.05)
Middle class (n=38/87; 43.6%)	28 (22.4)	10 (8)	Nil	87 (69.6)
Lower class (n=28/45; 62%)	12 (26.67)	14 (31.11)	2 (4.44)	17 (37.78)

Table 4: Relationship of anemia with gender

	Anemic (%)	Normal (%)
Male (total=108)	21 (19.45)	87 (80.56)
Female (total=108)	60 (55.56)	48 (44.44)

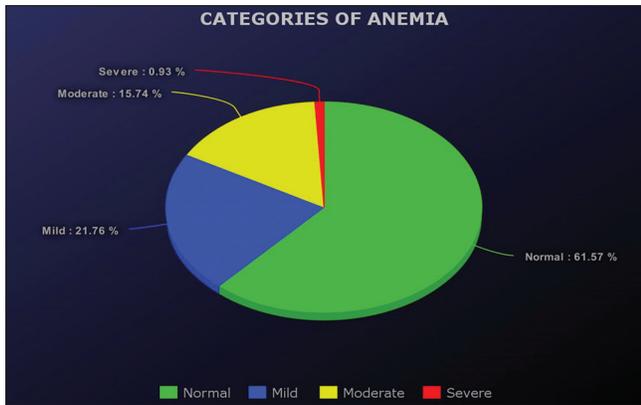


Figure 1: Nearly 21.76% of all the participants have mild anemia, 15.74% were suffering from moderate anemia and only 0.93% of participants were having severe anemia

The study showed that anemia had a strong relationship with gender as the prevalence of anemia among females was >55% as compared to males that had anemia in only 19.45% of the participants. Moreover, severe anemia was only found in females. One reason was male preferred families in Faisalabad, more diet was given to male members as compared to female members of the house. This practice was more common in lower socioeconomic class. The study findings are similar with Jones *et al.* who found more obesity and anemia in females as compared to females.^[9]

According to the socioeconomic status more underweight were found among participants of Lower class due to undernutrition and more overweight were found among participants of upper class due to the intake of fatty meals. Hence, overweight was found to be a problem of participants of upper class and undernutrition and underweight was found to be a problem of lower class. The results are similar to other studies where the anemia was associated with low socioeconomic groups and with obese people.^[6,10]

The intake of Fruits, vegetables, milk, and eggs have no statistical association with the HB level but participants taking meat and meat products >4 times/week were not found to have anemia at all. An interesting thing that was found among the participants that those participants which were educated or the adolescents whose parents were educated were mostly normal and the uneducated participants from any class even if they were from upper socioeconomic class were mostly either overweight or underweight.^[11]

CONCLUSION

It is concluded that Anemia specifically iron deficiency anemia is a serious health problem of Faisalabad. Association of different food items was not statistically significant,

but the participants taking fruits, milk, vegetables, meat and meat products were mostly have their HB level in normal range. This shows that food has a positive role in maintaining healthy life. Hence, special attention should be given on the dietary education of the population of Faisalabad. Anemia is even a bigger problem of females as compared to males, so special importance should be given on them as they are the future mothers and they should be monitored and reported on the routinely basis as to prevent future adverse outcomes.

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Conflicts of interest

There are no conflicts of interest.

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