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Research Article

**RELATIONSHIP AMONG IRON DEFICIENCY AND DAILY
FOOD CONSUMPTION AMONG GENERAL PUBLIC**Dr. Ikram Waheed¹, Dr. Muhammad Gulfam Hussian², Dr. Sana Fatima³¹Federal Government Polyclinic Hospital Islamabad²King Edward Medical University, Lahore³Nawaz Sharif Medical College, Gujrat

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Abstract:

Objective: To determine the association between dietary intake and iron deficiency anemia and to know the different methods for assessing the nutritional status.

Study design: A cross-sectional study.

Place and Duration: We conducted this study on general population of Rawalpindi for the duration of Six months from September, 2018 to March, 2019.

Methodology: This study was among the general population in which 216 subjects were enrolled (108 subjects were males and 108 were females), (Age=11-40 years). They were selected by simple random sampling living in during the study period. All married, unmarried, healthy willing persons were included after getting informed consent; they filled the forms. Study tool was the structured Questionnaire. Confidentiality of all the data was ensured. A questionnaire was designed to see the status of nutrition and association of anaemia. Data was collected by taking the history and physical examination of cases and taking their weight and height. Data was analyzed through SPSS version 21 and entered in proforma.

Results: The 38.43% of the participants were having anemia, among them 21.76% of the participants were having mild anemia, 15.74% of the participants were having moderate anemia and 0.93% of participants were having severe anemia. The 34.25% of participants were underweight and 9.7% participants were overweight. More than 55% of females were suffering from anemia. So far, the methodology based on hypothesis of Z-test I have arrived at the conclusion at C.I. 98% following results were found. This distinguished class signifies the percentage anaemic patients.

Conclusion: Most of the female participants were having anemia. There was a significant association between the intake of meat and hemoglobin level. So special measures should be taken to provide dietary education especially to females to have healthier mothers in the future.

Keywords: Iron deficiency anemia, Nutritional status, General Population, Under weight

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INTRODUCTION:

Despite the efforts of government and non-government organizations, nutritional deficiencies and anemia remains a major public health problem especially in people with low socio-economic status.[1] Anemia is usually defined as a decrease in the amount of red blood cells (RBCs) or hemoglobin 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 hemoglobin synthesis, red blood cell production or red cell survival, can all cause anemia. Hemoglobin 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 hemoglobin concentration can provide information about the severity of iron deficiency. [3,4,5]

Haem iron found in meat, fish and poultry, is much better absorbed than non-haem iron, which is found in eggs, grains, vegetables and fruits. [3,4] Liver, kidney, beef, chicken, tuna, egg yolk, iron-fortified cereals, dried fruits, nuts, dried peas, beans and dark green leafy vegetables are among the foods that rank highest in iron content. Foods that contain tannins, including coffee and tea, can reduce non-haem iron absorption by 50 to 60 percent. Legumes and grains contain substances called phytates that limit iron absorption, and certain proteins found in soybeans also have this effect. Phosphates, which are found in some types of soda, calcium and fiber may also hinder iron absorption.[2]

Processed wheat bran can also play role in the absorption of iron. Dairy products also help to absorb more iron if your iron levels are low. Vitamin C with iron-rich foods will help to absorb the iron more frequently.[5] Orange juice with your meal enhance the absorption of iron in body. Avoid use of tea with meals because it is the major fact to reduce the amount of iron that is absorbed in body. Most phenolic compounds are found in the leaves, stems and flowers and highly reactive to form iron-phenolic complexes in the intestine then iron less available for absorption.[1]

Recently, there has been increasing interest from epidemiologists about 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.[16] This correlation suggests that it is not only the poor who tend to be sick when everyone else is healthy, but that there is a continual gradient, from the top to the bottom of the socio-economic ladder, relating status to health. Moreover, Different Socioeconomic statuses have a strong relationship with different dietary intakes. [6,7] This present study was conducted as very little information about the nutritional status of General population in Rawalpindi is known. Recent studies in Rawalpindi 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 non-governmental organizations to formulate policies for the well-being of population of Rawalpindi as this population forms a major contribution in the population of Pakistan.

METHODOLOGY:

This study was among the general population in which 216 subjects were enrolled (108 subjects were males and 108 were females), (Age=11-40 years) living in that area. The population was divided into three groups. A. < 18 years, B > 18 years, and C > 30 years. All married, unmarried, healthy willing persons were included after getting informed consent; they filled the forms. Study tool was the structured Questionnaire. Confidentiality of all the data was ensured. A questionnaire was designed to see the status of nutrition and association of anaemia.

Measuring tapes, weighing scales (analogue) and stationery were used for the collection of data. Body mass index (BMI) was calculated by using the formula weight (Kg)/height (m²). The participant standing at the center of the scale and not holding anything, adjusting scale at zero. Measurement taken from heel to knee, knee to hip, hip to shoulder and shoulder to top of the head. BMI was calculated and categorized in to four groups. Group 1. Underweight less than BMI of 19 kg/m². Group 2. Normal BMI of 19.8-24.9 kg/m². Group 3. Overweight BMI OF 25-29.9 kg/m². Group 4. Obese BMI of more than 30 kg/m².

Food Frequency Questionnaire was filled by participants by recalling dietary intake during last one week. Pilot testing of questionnaire was carried out and editing of questionnaire was done accordingly. Level of Hemoglobin was checked by taking the blood samples of all the participants. Anemia was

categorized by assessing the normal level of HB as follows:

Females 12-18 years having HB Level 12.0-16.0 g/dl.
Males 12-18 years having HB Level 13.0-16.0 g/dl.
Female more than 18 years having HB Level 12.1-15.1 g/dl.
Males more than 18 years having HB Level 13.6-17.7 g/dl.
Middle age Males having HB Level 12.4-14.9 g/dl.
Middle age Females having HB Level 11.7-13.8 g/dl

RESULTS:

The anaemia was more prevalent in children, < 18 years, as compared to peoples above 18 and middle age group people. The division of participants according to socio-economic status was like, 46 in upper class, 125 of middle class and 45 lower class. (Table1)

Table No 01: Relationship of Socioeconomic Status with BMI

Status	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

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 1)

More people were affected with anemia in lower class as compared to others. There were 62%, 43.6%, 37% people affected with anaemia in lower, middle and upper class respectively. (Table 2)

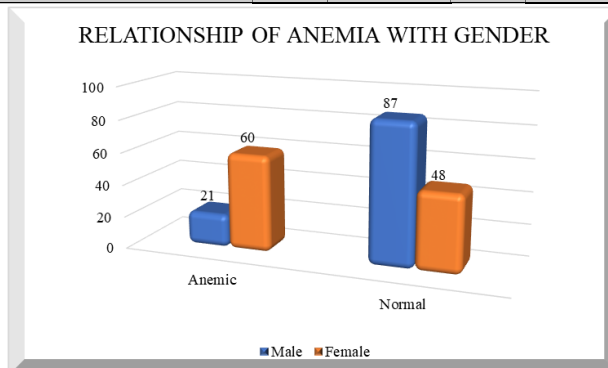
Table No 02: Relationship of Anemia with Socioeconomic Status

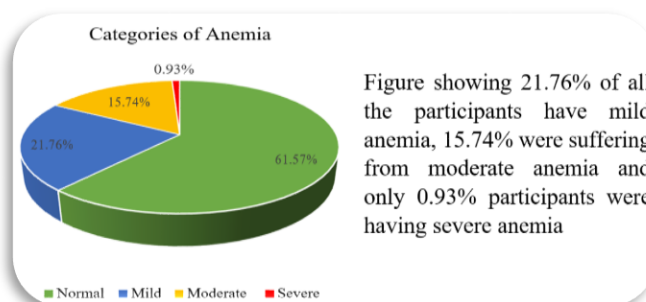
STATUS	MILD	MODERATE	SEVERE	NORMAL
UPPER CLASS (N=17/46) 37%	7 (15.21%)	10 (21.75%)	Nil	29 (63.05%)
MIDDLE CLASS (N=38/87) 43.6%	28 (22.4%)	10 (8%)	Nil	87 (69.6%)
LOWER CLASS (N=28/45) 62%	12 (26.67%)	14 (31.11%)	2 (4.44%)	17 (37.78%)

The frequency of anemia was far more in females than in males. More than half of the females were suffering from Anemia. (Table 3)

Table No 03: Relationship of Anemia with Gender

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





The intake of fruits, vegetables, milk and eggs showed no association with the anemia, however, those participants that were taking milk, meat, fruits and vegetables were mostly having hemoglobin level in normal range. Participants that were taking fats and oils more than 4 times a week were mostly overweight. Moreover, none of the participant taking meat and meat products more than 4 times a week had anemia.

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]

The study showed that anemia had a strong relationship with gender as prevalence of anemia among females was more than 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 Rawalpindi, more diet was given to male members as compared to female members of the house. This practice was more common in lower socio-economic class. Our study findings are similar with Jones et al (2016) who found more obesity and anemia in females as compared to males. [9]

According to the socioeconomic status more underweight were found among participants of Lower class due to under-nutrition and more overweight were found among participants of Upper class due to intake of fatty meals. So overweight was found to be a problem of participants of upper class and under-nutrition and underweight was found to be a problem of lower class.[14] The results are like other studies where the anaemia was associated with low socioeconomic groups and with obese people. [6,10,11]

The intake of Fruits, vegetables, milk and eggs have no statistical association with the hemoglobin level but participants taking meat and meat products more than 4 times a week were not found to have anemia at all.[12] 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 un-educated participants from any class even if they were from upper socioeconomic class were mostly either overweight or underweight.[13]

Addition of meat servings during meal times also help to enhance the absorption of iron.[15] Recently, there has been increasing interest from epidemiologists about 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.[16] This correlation suggests that it is not only the poor who tend to be sick when everyone else is healthy, but that there is a continual gradient, from the top to the bottom of the socio-economic ladder, relating status to health.

CONCLUSION:

Anaemia was most prevalent in the female participants presented population. The disease was significantly associated with the intake of meat and other dietary elements.

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