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Research Article

**A CROSS SECTIONAL STUDY ON THE PREVALENCE OF
ANEMIA IN HEALTHY SCHOOL AGE POPULATION IN
LAHORE**Dr Farheen Shahid¹, Dr Anam Ikram², Dr Maryam Ikram³^{1,2,3} King Edward Medical University, Lahore**Article Received:** August 2020**Accepted:** September 2020**Published:** October 2020**Abstract:**

Objective: The aim of our study was to determine the prevalence of anemia in Healthy school age population in Lahore.

Study Design: Cross sectional study.

Place and Duration of Study: We conducted this study at Pediatric Medicine department Mayo Hospital Lahore for the duration of six months from December, 2019 to May, 2020.

Methodology: A total of 120 children were enrolled in the study fulfilling the inclusion/exclusion criteria presenting to Pediatric Medicine department Mayo Hospital Lahore. We used non probability purposive sampling technique. After obtaining an informed written consent of the parents/guardians of the children, the data was included in the study. EDTA treated tubes were used to collect the blood samples and transported on ice. Complete Blood Count examination was carried out. According to WHO guidelines, a hemoglobin (Hb) value <11.5 gm/dl was used as cut off for anemia for this age group. The data was analyzed through SPSS-20, mean and standard deviation was calculated for age and Hb levels of the children. Frequency and percentage were calculated for qualitative variable like gender and presence/absence of anemia.

Results: In our study, out of 120 cases, 70 were between 4-10 years of age while 50 were between 11-15 years of age, mean + SD was calculated as 10.00+3.17 years, 61 were male while 59 were females, frequency of anemia in healthy school age population in Lahore was recorded in 44 children.

Conclusion: We decided that the frequency of anemia among healthy School age population in Lahore is expanding, so every child must be examined to discourse this curable issue.

Keywords: Healthy school age population, Lahore, Anemia.

Corresponding author:**Dr. Farheen Shahid,**

King Edward Medical University, Lahore.

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INTRODUCTION:

Anemia is defined as “condition in which hemoglobin (Hb) concentration or red blood (RBC) mass less than the 5th percentile for age [1].” It is a common problem, especially among children and pregnant women with 40% frequency of anemia in the world. Frequency of anemia is increasing in developing countries than the developed ones [2]. The frequency of anemia in pre-school and school-age children is estimated to be 50% and 46%, respectively [3]. Anemia occurs due to (3) basic mechanisms: (I) decreased production of red blood cells; (ii) blood loss; and (iii) increased destruction of red blood cells. The main causes are ranging from (a) nutritional deficiencies such as of iron deficiency, folic acid and vitamin B12; (b) chronic diseases like tuberculosis and human immunodeficiency virus; (c) parasitic diseases like schistosomiasis, hookworm; and (d) haemoglobinopathies, including thalassemia, sickle cell disease and glucose (6) phosphate dehydrogenase (G6PD) deficiency. Infants, children, adolescents and pregnant women are at a higher risk of anemia because they have increased needs of iron, folic acid and other nutrients [4,5].

In Pakistan, incidence of chronic infections, malaria and nutritional deficiencies are high and all of which are known to cause anemia. Anemia results in physical symptoms such as dizziness, tachycardia, easy fatigue ability and shortness of breath. It is also adversely affecting the behavior, cognitive performance, and physical growth of infants, preschool and school going children. In Pakistan, the children belong to poor socio-economic statuses are the most neglected children as far as health care is concerned. The country like Indonesia has covered 60% of its target population via folic acid and iron supplementation to prevent iron deficiency anemia. We still have not known the exact frequency of anemia in our school age population [6]. A local study recorded 33.2% of the children to be anemic [7] while a recent study [3] recorded these findings as 40.5% in children between 6-12 years of age and 30.1% between 12-14 years of age. The rationale of the study is that in our local population, data are still lacking to determine the exact prevalence of anemia in healthy school aged group and socio-demographic factors associated with anemia that will enable the development of local strategies to treat and prevent anemia in Pakistani children. In this study we aimed to estimate the prevalence of anemia in Pakistani healthy school aged children.

METHODOLOGY:

We conducted this study at Pediatric Medicine department of Mayo Hospital Lahore for the duration of six months from December, 2019 to May, 2020. A total of 120 children were enrolled in the study fulfilling the inclusion/exclusion criteria presenting to Pediatric Medicine department Mayo Hospital Lahore with 95% confidence level, 8% margin of error and taking expected percentage of anemia in school going children 33.2%.

We used non probability purposive sampling technique for selection. All healthy school going children (according to operational definition), age between 4-15 years of either sex. According to exclusion Criteria, children suffering from chronic illnesses like tuberculosis, congenital heart disease, malabsorption, malnutrition disorders and already taking treatment for anemia (confirmed on history and medical record) were not included in the study.

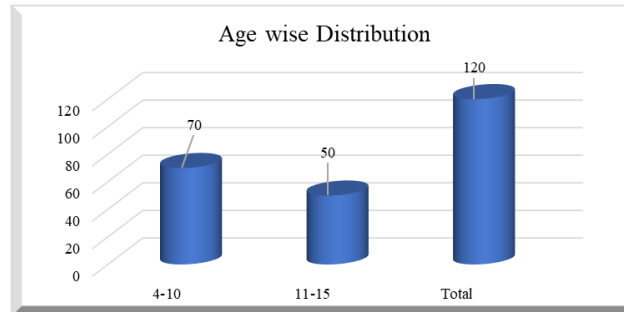
Informed written consent from parents/ guardian of 120 children meeting the inclusion criteria were selected. EDTA treated tubes were used to collect all blood samples and transported on ice. Complete Blood Count examination was carried out by Melonic CA 620. Commercial controls were tested before each batch and results investigated. According to WHO guidelines, a hemoglobin (Hb) value <11.5 gm/dl was used as cut off for anemia for this age group. Anemia severity is classified as follows: Mild anemia; Hb values between 9.5 gm/dl and 11.5 gm/dl, Moderate anemia; Hb values between 7.5 gm/dl and 9.5 gm/dl, and Severe anemia; Hb of less than 7.5 gm/dl. All this information was recorded on a pre-designed proforma. Finally, the data was analyzed through SPSS version 20. Mean and standard deviation was calculated for quantitative variables like age and Hb levels of the children. Frequency and calculated percentage for qualitative variables i.e. gender and presence/absence of anemia in healthy school aged children. Stratification for age and gender was done to control the effect modifiers.

RESULTS:

In our study, out of 120 cases, 70 were between 4-10 years of age while 50 were between 11-15 years of age, mean + SD was calculated as 10.00+3.17 years.

Table No 01: Distribution of children according to age

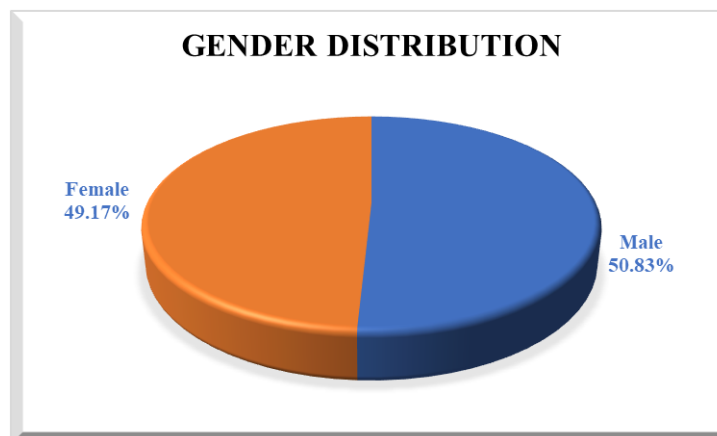
Age(years)	Qty	% age
4-10	70	58.33%
11-15	50	41.67 %
Total	120	100 %
Mean + SD	10.00±3.17	



Distribution of children according to gender showing 61 (50.83%) children were male while 59 (49.17%) children were females (Table No. 2).

Table No 02: Distribution of children according to gender

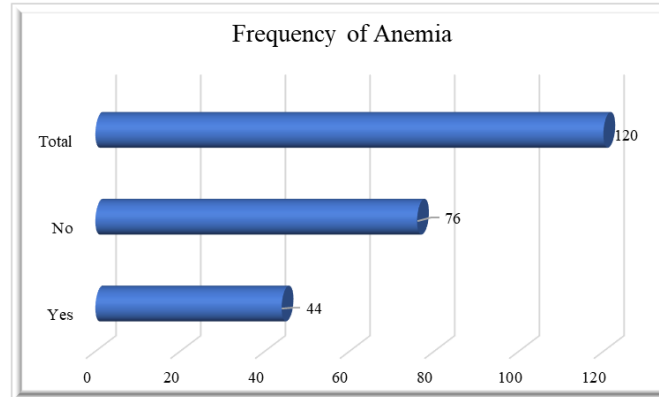
Gender	Qty	%age
Male	61	50.83%
Female	59	49.17%
Total	120	100%



Frequency of anemia in healthy school age population in Lahore was recorded in 44 (36.67%) children while 76 (63.33%) children had no findings of anemia (Table No. 3).

Table No 03: Frequency of anemia in healthy school age population

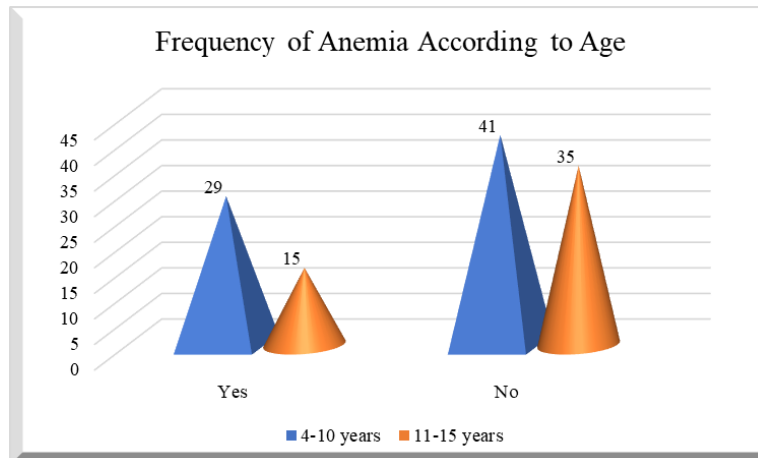
Anemia	Qty	%age
Yes	44	36.67%
No	76	63.33%
Total	120	100%



Stratification for frequency of anemia in healthy school age population in Lahore with regards to age shows that out of 44 cases of anemia 29 were between 4-10 years while 15 were between 11-15 years of age, p value was calculated as 0.20 (Table No. 4).

Table No 04: Stratification for Frequency of Anemia According to Age

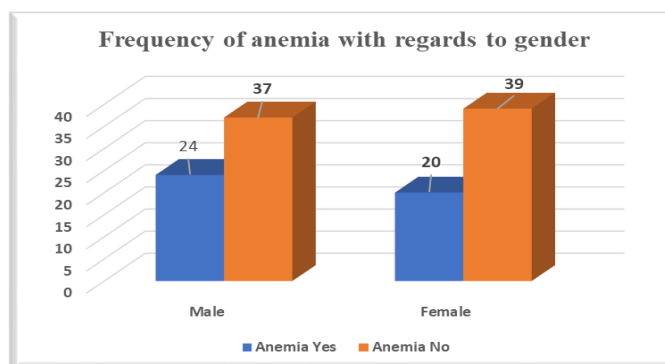
Age (years)	Anemia		P value
	Yes	No	
4-10	29	41	0.20
11-15	15	35	



Stratification for frequency of anemia in healthy school age population in Lahore with regards to gender shows that out of 44 cases of anemia 24 were male while 20 were females; p value was calculated as 0.53 (Table No. 5).

Table No 05: stratification for Frequency of Anemia According to Gender

Age (years)	Anemia		P value
	Yes	No	
Male	24	37	0.53
Female	20	39	

**DISCUSSION:**

In rising countries, anemia is one of the prime health problems disturbing more than 50% of school age children. In Pakistan, existence of anemia in children has been reported in several local studies as well as in WHO reports [8]. A child with anemia has been conclusively seen to poor cognitive performance, delay psychomotor development, decrease working capacity and impaired immunity. We planned this study in our local setup with the view that recent findings are not recorded which needs another recent study to record and compare with other studies so that the recent research-based statistics may be determined to control this treatable morbidity.

In our study, out of 120 cases, 70 (58.33%) children were between 4-10 years of age while 50 (41.67%) children were between 11-15 years of age, 61 (50.83%) children were male while 59 (49.17%) children were females, frequency of anemia in healthy school age population in Lahore was recorded in 44 (36.67%).

The frequency of anemia in our study are agreed with the findings of other study recorded 33.2% of the children to be anemic [7] while another study [3] recorded these findings as 40.5% in children between 6-12 years of age and 30.1% between 12-14 years of age. The frequency of anemia was 27.1% in study done by Firehiwot Mesfin in Eastern Ethiopia in 2015 [9].

The frequency of anemia in this study is much lower than the frequency of anemia in other reports conducted in Tanzania (79.6%), [10]. In Kenya (35.3%), [11]. And in Nigeria (82.6%) [12]. The frequency of anemia is lower in this study might be due to the fact that socio-economic status of Pakistan is much better than these counties which is one of the major causes of anemia.

The frequency of anemia varies according to sociodemographic characteristics of children and their families. Children from families with low monthly income were likely to be anemic than those children from families with high monthly income. This might be due to the fact that families with low monthly income may not get enough foods rich in iron. These results also comparable with the study conducted in the Ningxia and Qinghai's [13].

A study [14] conducted at Khyber Pakhtunkhwa recorded the total prevalence of anemia in school age children are 34.0% which also supports in our study. There is a rapid growth with an increased iron requirement during first 2 year of life; therefore, a chance of anemia is higher in this age. Moreover, few factors such as limited access to iron containing food, lack of breast feeding, inappropriate weaning and chronic illnesses increase the chance of young children developing anemia [15].

The rising trend of consuming junk foods and snacks is also responsible for so called 'healthy' but anemic children. This fad is also spreading to the lower socio-economic status as well. The increase prevalence of anemia among children on vegetarian diet in the present study further adds to the already existing evidence indicating that vegetarian diets are a poor source of iron [16,17].

In summary, our findings support the hypothesis that frequency of anemia in healthy school aged children is rising. To reduce the burden of anemia in healthy school aged children, government officials must plan short term programs such as iron supplementation and long-term programs including wheat flour fortification.

CONCLUSION:

We concluded that the occurrence of anemia among healthy school age population in Lahore is growing, so that every child must be screened to address this curable issue.

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