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Assess Prevalence of Anemia among Children and Adolescents

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ABSTRACT
Background:
Planning preventative measures requires knowledge of the incidence of anemia in school-age children as well as the risk factors that already exist. Anemia is a significant public health issue. Anemia is more common.
among women in contrast to men. It has a negative impact on learning and academic performance and impairs cognitive and physical work capability.
Objective:
The purpose of this study was to ascertain the prevalence of anemia in school-age male and female children (6–18 years old)
Methods and subjects:
235 school-age children (6–18 years old)—116 males and 119 females—were the subjects of a cross-sectional study. Participants and their family members gave their oral consent. Each participant had a blood sample drawn in order to determine the prevalence of anemia and related factors in the study population.
Findings: The study found that 38.7% of people had anemia overall. was 53.8% for girls and 23.3% for males, with a statistically significant difference. There was a statistically significant difference in the prevalence of anemia between families with fewer than five members (27.1%) and those with more than five members (74.1%).
Results:
According to the current study, children born to fathers with low levels of education had anemia at rates of 64%, 54.5%, and 10.1%, respectively. Children of illiterate and somewhat educated mothers had anemia rates of 56.4% and 17.4%, respectively, with a statistically significant difference. According to the study's findings, the prevalence of anemia in infants born to farmers, merchants, government employees, and private employees was 61.8%, 48.5%, 5.6%, and 26.7%, respectively. According to the mothers' occupations, there were statistically significant differences in the percentage of anemic children born to housewives, merchants, and private employees: 41.4%, 33.3%, and 20%, respectively. According to the study, children who ate meat once a week had anemia rates of 66.2%, whereas children who ate meat twice a week had anemia rates of 38.7%. These differences were

statistically significant. Children who ate vegetables once a week had a 55% anemia rate, those who ate them twice had a 28.8% anemia rate, and those who ate veggies three times or more a week had a 15.9% anemia rate.
Conclusion
According to the current study, anemia rates were 44.1% for those who ate fruits once a week, 13% for those who ate twice a week, and 11.8% for those who ate three or more times a week.
Keywords: children, prevalence of anemia.

Introduction:
According to De L et al. (2011), anemia is a disorder marked by a decrease in the quantity of red blood cells and/or hemoglobin (Hb) content. Anemia is a condition that is highly prevalent around the world and can affect people at any age, although it primarily affects preschool-aged children (Assis et al., 2004).
According to World Health Organization cut-offs, anemia was defined as a hemoglobin level of < 11 g/dl for females and < 12 g/dl for boys (Garg et al., 2016). According to Djokic et al. (2010), anemia is a worldwide public health issue that impacts both developed and developing nations. Participants were deemed anemic if their red blood count was less than 4 m/ml. Children and adolescents are much more vulnerable to iron deficiency anemia, which is more prevalent in developing nations (De Andrade Cairo et al., 2014).
Anemia is a global nutritional issue that is more common in impoverished nations (Djokic et al., 2010; Hioui et al., 2010). About 25% of people worldwide suffer from anemia, making it a public health concern (WHO, 2008). Learning and academic performance are negatively impacted by anemia, which also lowers cognitive function and physical labor capacity (Akramipour et al., 2009).
With its numerous detrimental effects on both health and the socioeconomic advancement of the nations, anemia is a global public health issue that affects both developed and emerging nations (Stevens et al., 2013).
Patients and method
235 randomly chosen school-age children (6–18 years old) participated in a cross-sectional analytical study. Sociodemographic information was gathered using a self-made study questionnaire, and each participant provided blood samples so that RBC and hemoglobin levels could be measured with a cell counter.
RBC counts below 4 million per cubic milliliter were deemed anemic for both sexes, while hemoglobin levels below 11 and 12 g/dl were deemed anemic for girls and boys, respectively (Garg et al., 2016).
Statistical analysis: Information was gathered, edited, coded, and loaded into version 20 of the Statistical Package for Social Sciences (SPSS). To compare relative frequencies, the chi-square test, Fisher's exact test, and independent sample T test were employed. A P value of less than 0.05 was deemed significant.
Ethical considerations: All participants and their families were informed of the study's goals and methods, and they gave their verbal agreement to take part.
Result
Anemia affected 38.7% of people overall, with a statistically significant difference (P<0.00) between 23.3% of men and 53.8% of women. The difference between the age groups of "6-11 years" (42.3%) and "12-18 years" (35.5%) was statistically significant (P <0.01).
Anemia affected 74.1% of families with five or more members and 27.1% of families with fewer than five members, with a statistically significant difference (P<0.00) (Table 1).

Table 1: Anemia prevalence among school-age children in the Giza Governorate by certain demographic characteristics

Groups / Parameters	Normal No.	Normal %	Anemic No.	Anemic %	Total No.	Total %	P Value
Gender							
Males	89	76.7	27	23.3	116	49.4	<0.00
Females	55	46.2	64	53.8	119	150.6	
Age group							
6 - 11 y.	64	57.7	47	42.3	111	47.2	<0.01
12 - 18 y.	80	64.5	44	35.5	124	52.8	
Family size							
Less than 5	129	72.9	48	27.1	177	75.3	<0.00
5 and more	15	25.9	43	74.1	58	24.7	
Total	144	61.3	91	38.7	235	100	

X2 test was used.

Male and female mean red blood cell counts were 4.83 + 0.738 and 4.117 + 0.626, respectively, with a statistically significant difference (P <0.001). The mean hemoglobin levels in males and females were 13.270 + 2.117 and 11.194 + 1.660, respectively, with a statistically significant difference (P <0.001). There was no statistically significant variation in the number of red blood cells between the ages of 6–11 and 12–18. The mean hemoglobin value for the age groups 6–11 and 12–18 years was 11.907 + 1.918 and 12.497 + 2.330, respectively, with a statistically significant difference (P <0.03) (Table 2).

Table 2: Hematological parameters and characteristics of school-age children in the Giza Governorate (RBCs milliom/ml and Hb g/dl)

Parameters	Groups	Min.	Max.	Mean	St. dev.	No. (235)	P Value
Gender	Males	3.2	5.9	4.83	0.738	116	< 0.001
	Females	2.6	5.3	4.117	0.626	119	
Hb value	Males	9.30	16.7	13.270	2.117	116	< 0.001
	Females	7.30	14.6	11.194	1.660	119	
Age groupRBCs	6-11 y.	2.8	5.8	4.376	0.722	111	0.079
	12-18 y.	2.6	5.9	4.552	0.805	124	
Hb value	6-11 y.	8.4	16.0	11.907	1.918	111	0.03
	12-18 y.	7.3	16.7	12.497	2.330	124	

The study found that, with a statistically significant difference (P <0.001), 10.1% of children were anemic who were born to fathers with a high level of education, 54.5% of children were anemic who were born to fathers with a moderate level of education, and 64% of children were anemic who were born to fathers with no formal education. There was a statistically significant difference (P <0.001) between the 17.4% of infants born to moderately educated mothers and the 56.4% of children born to illiterate mothers who were anemic (Table 3).

Table 3: Anemia prevalence in school-age children in the Giza Governorate by mother and father educational attainment.

Parameters\ Groups	Normal	Anemic	Total	P Value
Father's Education	No. %	No. %	No. %	
Illiterate	9-36.0	16-64.0	25-10.7	<0.001
Moderate	55-45.5	66-54.5	121-51.5	
High	80-89.9	9-10.1	89-37.9	
Mother's Education				
Illiterate	58-43.6	75-56.4	133-56.6	<0.001
Moderate	76-82.6	16-17.4	92-39.1	
High	10-100	0-0.0	10-4.3	
Total	144-61.3	91-38.7	235-100	

61.8% of children born to farmer fathers, 48.5% of children born to merchant fathers, 5.6% of children born to government employee fathers, 26.7% of children born to private employee fathers, and 100% of children born to daily laborer fathers were anemic, according to the current study. These findings showed a statistically significant difference (P<0.001). With a statistically significant difference (P <0.015), 41.4% of children born to housewives were anemic, compared to 33.3% of children born to merchant mothers and 20% of children born to private employee moms

The study found that, with a statistically significant difference (P <0.001), 66.2% of children who ate meat once a week, 38.7% of children who ate meat twice a week, and none of the children who ate meat three times or more a week were anemic. In terms of weekly vegetable consumption, there was a statistically significant difference (P <0.001) between the anemic rates of 55% of children who ate vegetables once a week, 28.8% of children who ate vegetables twice a week, and 15.9% of children who ate vegetables three times or more a week. When it came to consuming fruits, 44.1% of kids who ate them once a week, 13% of kids who ate them twice a week, and 11.8% of kids who ate them three times or more a week were anemic, with a statistically significant difference (P <0.001)

DISCUSSION

The sample size was 800 girls ,39.9% of the participants in the study were anemic (Suzan et al., 2016). Our study's overall anemia prevalence of 38.7% is in line with this one.

The total prevalence of anemia was 59.3% in a cross-sectional descriptive study involving students aged 6 to 19 in randomly chosen Girls Education Initiative Schools . The prevalence exceeds our study's findings (Rasha et al., 2016).

Due to their higher iron needs for supporting their quick growth and mental development as well as to replace iron lost through menstruation, teenage girls are more susceptible to anemia (Sachan et al., 2013).

Half of the 200 teenage girls who attended the Biochemistry Clinical Laboratory of the Indira Gandi Institute of Medical Sciences in Panta, Bihar, India for six months (April 2015–October 2015) were found to be anemic, according to a cross-sectional study (Rekha et al., 2017). It is greater than what our investigation found.

From March 1 to April 30, 2017, a cross-sectional survey was carried out in Dembia District at schools. showed that 25.5% of teenage girls (ages 15 to 19) had anemia overall (Kedir et al., 2017). It didn't match the results of our investigation.

According to a cross-sectional study done between March 15 and May 25, 2014, among 408 school-age adolescents in Bonga Town, Southwest Ethiopia, the overall prevalence of anemia was 15.2% (Melkam et al., 2015). Additionally, it didn't match the results of our investigation.

According to the current study, the prevalence of anemia was 10.1% among children born to fathers with a high level of education, 54.5% among children born to fathers with a moderate level of education, and 64% among children born to fathers with no formal education. These findings exceeded those of Melkam et al. (2015), who found that the anemia rates were 38.8% for children born to fathers with no formal education, 12.3% for children born to fathers with a primary education, 8.6% for children born to fathers with a secondary education, and 6.5% for children born to fathers with a high level of education.

Anemia was found to be 37.4% in children born to educated fathers and 58.9% in children born to uneducated fathers in a study by Rasha et al. (2016). These outcomes fell short of our study's findings.

Anemia among children born to illiterate mothers was 56.4% in the current study; this finding was comparable to that of Rasha et al. (2016), who found that anemia among children born to illiterate mothers was 58.9%. According to this study, 17.4% of children born to moms with a moderate level of education had anemia. Compared to Rasha et al. (2016), who found that anemia was 58.7% in children born to educated moms, this result was significantly lower.

In Bonga Town, Southwest Ethiopia, a cross-sectional survey of school-age adolescents found that anemia rates were 12.7% for children of housewives, 21.1% for children of merchant moms, and 15.4% for children of working mothers (Melkam et al., 2015). These findings were significantly less than those of the current study, which showed that anemia was present in 41.4% of infants born to housewives, 33.3% of children born to merchant moms, and 20% of children born to women who worked for private companies. According to Melkam et al. (2015), anemia rates were 30.4% for children born to farmers, 10.3% for children born to merchant fathers, and 13.7% for children born to employed fathers.

These outcomes paled in comparison to the current study's findings.

In Bonga Town, Southwest Ethiopia, a cross-sectional study of school-age teenagers found that anemia was 12.8% among those who ate meat twice a week and 15.4% among those who ate it less frequently (Melkam T et al., 2015).

In Denizli, Turkey, another study of teenagers aged 12 to 19 years found that anemia was 87% among those who ate meat once a week and 13% among those who ate meat twice a week or more (Isik Y, et al., 2012). The findings of these investigations differed from those of our investigation.

According to a cross-sectional study conducted among teenage girls aged 10 to 19 living in an urban area of Mumbai, India, anemia was 91.5% among those who ate fruits once a week and 71.6% among those who ate fruits twice a week or more.

According to Srinivas et al. (2015), anemia was 90.9% in those who ate green leafy vegetables once a week and 74.8% in those who ate them twice a week or more. These outcomes were significantly better than those of the current investigation.

Conclusion

According to the current study, anemia rates were 44.1% for those who ate fruits once a week, 13% for those who ate twice a week, and 11.8% for those who ate three or more times a week.

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