

ORIGINAL ARTICLE

Assessment of Knowledge and Screening for Anemia: A Cross-sectional Study among the Female Students of a Degree College

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ABSTRACT

Introduction: Despite India being the first country to initiate the National Nutritional Anemia Prophylaxis Programme in 1970, anemia is still widely prevalent. One of the factors which help in decreasing the cases of anemia relation to social correlates includes increasing awareness about anemia among young girls. **Materials and Methods:** A cross-sectional study was conducted for a period of 6 months among the students of arts degree college, Bidadi in 2019. Non-probability samples (convenience sample) of 156 students were selected for the study. A pre-tested and semi-structured questionnaire was given to the students to assess their knowledge about anemia. Students were screened for anemia by estimating their hemoglobin levels using Hemocue Hb301 instrument. **Results:** The mean age of the students was 19.05 ± 1 years. The magnitude of anemia was found to be 41%. Among the students who were anemic, 39 (25%) were having mild anemia, 24 (15.4%) students were moderately anemic, and 1 (0.6%) were severely anemic. Regarding the knowledge level about anemia, 31 (28%) students had poor score, 66 (60%) students had average score, and 13 (12%) students had good score. **Conclusion:** Magnitude of anemia was high among the young girls and most of the anemic girls were having mild degree anemia. Nearly one-third of the students had not heard about anemia. Majority had an average knowledge on anemia and one-fourth of the students had poor knowledge. There was no statistically significant association between age of the participants and degree of anemia.

Key words: Anemia, Hemocue Hb301, students

INTRODUCTION

According to the World Health Organization (WHO), anemia is a condition where red blood cell number or the oxygen carrying capacity of the red blood cells is not sufficient to meet the body's physiologic needs. It differs with age, gender, altitude, smoking, and pregnant conditions.^[1] Anemia affects 1.62 billion people all over the world which corresponds to 24.8% of the world.^[2] Anemia is not just a medical concern but a social concern too as it decreases the productivity in women.^[3] According to the National Family Health Survey (NFHS)-III data, the prevalence of anemia among women of age 15–49 years in Karnataka is 52.2%, with severe anemia in 2.2%, moderate anemia in 15.4%, and mild anemia in 34.5%.^[4] One of

the studies shows that there is a direct relation between knowledge and prevention of anemia.^[5] Many studies have shown that low iron intake,^[6] lesser Vitamin C intake,^[7] and lower gastric acidity compared to population of European decent.^[8] Parasitic infection such as hookworm and malaria^[9] is also important causes of anemia. Anemia is a severe public health problem mostly seen among women of reproductive age group. The factors which help in decreasing the cases of anemia relation to social correlates include increasing awareness about anemia among adolescents and providing educational intervention about diet to prevent anemia in schools.^[10]

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How to cite: Achappa S, Harshitha J, Bhumika S, Assessment of Knowledge and Screening for Anemia: A Cross-sectional Study among the Female Students of a Degree College 2021;9(2):219-222.

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The WHO defines youth as the 15–24 years age group, higher prevalence of anemia is seen in girls in this age group when requirements are at peak. Adolescence is an opportunistic time for health education about anemia. Iron deficiency is produced by dietary lack, impaired absorption, increased requirement, or chronic blood loss.^[11] Consumption of enhancers and inhibitors affects iron absorption. Enhancers include ascorbic acid, meat, poultry, fish, and inhibitors comprise calcium, dairy products, phytates, and tannins found in tea and coffee.^[12]

Despite India being the first country to initiate the National Nutritional Anemia Prophylaxis Programme in 1970, anemia is still widely prevalent. Poor quality diets do not fulfill iron requirements of large sections of menstruating women and would not replenish iron reserves.^[13]

In this regard, the present study was done with the following objectives.

Objectives

The objectives of the study were as follows:

1. To determine the magnitude of anemia among the students
2. To assess the knowledge of the students about anemia.

MATERIALS AND METHODS

A cross-sectional study was conducted for a period of 6 months February–July 2019 among the female students of an arts degree college in Bidadi, Karnataka. All the students present on the day of study and willing to participate were included after taking the consent. A pre-tested and semi-structured questionnaire was given to the students to assess their knowledge about anemia. Students were then screened for anemia by estimating their hemoglobin levels using Hemocue Hb301 instrument. It is a widely used method in field settings. Hemocue Hb301 system provides quick, easy access to the results. The tip of a finger in the left hand was pricked with a lancet and the first drop of blood was wiped with cotton. A standard Hb301 microcuvette was used to collect the blood and immediately inserted in the Hemocue Hb301 device for analysis. The results were displayed numerically in g/dl at the time of measurement. The sensitivity and specificity of Hemocue 301 are 90% and 80%, respectively, for detecting anemia.^[14] Classification of anemia was done as per the WHO guidelines for non-pregnant women in the reproductive age group (15 years and above), according to the WHO, hemoglobin of ≥ 12 g/dl was considered normal, 11–11.9 g/dl as mild, 8–10.9 g/dl as moderate, and < 8 g/dl was considered as severe anemia.^[15]

Knowledge of the students about anemia was assessed by questions on what is anemia, its causes, risk factors, and

symptoms and categorization was done based on a scoring system. Students with a score of < 3 were considered as poor, with score of 4–6 as average, and with score of 7 and above were considered to have good knowledge. The data were compiled in MS Excel and analyzed using Statistical Package for the Social Sciences (SPSS) Version 20.0. Descriptive statistics were presented in percentages and proportions. Chi-square test was used to test the statistical significance.

RESULTS

There were 156 students participated in the study. Students were between the age group of 17 and 22 years. The mean age of the students was 19.05 ± 1 years. All the students belonged to Hindu religion. Out of 156 students, 110 (70.5%) had heard about anemia. For majority of the students, 59 (54%) doctors were the source of information followed by television 34 (31%).

Table 1 shows among the 110 students who heard about anemia, majority 99 (90%) knew that anemia means reduced level of hemoglobin in the blood. Greater part of the students 103 (94) knew not consuming nutritious food is a risk factor for anemia. Larger section of the students 93 (84%) did not know that hookworm can cause anemia. Majority of the students 91 (83%) did not agree on the point that not wearing chapels can be a risk factor for anemia. Iron deficiency in the food as a cause for anemia was known to 56 (51%) of the students but greater part of the students 76 (69%) failed to mention the iron rich foods. Larger part of the students did not agree on the points that consuming coffee/tea immediately after food and eating unwashed vegetables can be risk factors for anemia accounting for 100 (91%) and 71 (64%), respectively. Majority of the students 89 (81%) agreed that easy fatigability is a symptom of anemia but 75 (68%) students believed that palpitation is not a symptom of anemia. Among the students who had heard about anemia, knowledge was assessed based on a scoring system. According to this, 31 (28%) students had poor score, 66 (60%) students had average score, and 13 (12%) students had good score.

The magnitude of anemia was found to be 41%. Among the students who were anemic, 39 (25%) were having mild anemia, 24 (15.4%) students were moderately anemic, and 1 (0.6%) were severely anemic. The mean hemoglobin level was $12.1 \text{ g/dl} \pm 1.5 \text{ g/dl}$ with minimum Hb level being 7.9 g/dl and maximum being 19.6 g/dl.

Table 2 show among the participants in the age group of 17–19 years, mild anemia was 20% and moderate anemia was 18%, whereas among the participants in the age group of 20–22 years, mild anemia was 35% and moderate anemia was 10%. There was no statistically significant association between age of the participants and degree of anemia.

DISCUSSION

According to the NFHS 5, it is noted that in Karnataka, magnitude of anemia among women in the age group of 15–19 years is 49.4% which was 45.3 in NFHS 4. Hence, anemia prevalence is increasing in Karnataka.^[16] In the present study, the magnitude of anemia was 41% which is comparable to the state statistics.

In the present study, 71% of the students had heard about anemia and doctors were the source of information for majority of the students, whereas in a study conducted by Angadi and Ranjitha among the adolescents in the urban slums of Davangere city, Karnataka (2016),^[5] 91% had heard about anemia and the main source of information was teachers. In the present study, 90% of the students who had heard about anemia knew that anemia means reduced level of hemoglobin in the blood but in a study conducted by Angadi and Ranjitha,^[5] 36% of girls answered correctly that hemoglobin level is decreased in anemia. In the present study, 94% of the students knew not consuming nutritious food is a risk factor for anemia and iron deficiency in the food as a cause for anemia was known to 51% of the students but only 16% knew that hookworm can cause anemia, whereas

in a study conducted by Angadi and Ranjitha,^[5] 40% of the participants told that anemia is due to deficiency of iron and 33% answered that poor diet to be the only cause of anemia and 14% answered that anemia is to multiple causes such as worm infestation, poor diet, and excessive flow during menstruation. In the present study, 81% of students agreed that easy fatigability is a symptom of anemia, whereas in the study by Angadi and Ranjitha,^[5] 31% told that body weakness/tiredness is the only feature of anemia and 12% answered anemia manifests with multiple signs and symptoms. Even though more students had heard about anemia in the study by Angadi and Ranjitha,^[5] the awareness about anemia was more in the present study. The difference in the knowledge level may be due to difference in the age of the participants and also place of study. The mean age of the students in the present study was 19 years and students were from college whereas the mean age was 13 years and students were from government schools in the study by Angadi and Ranjitha.^[5] In a study done by Ahwal adolescent girls in a selected college of New Delhi in 2016,^[17] the level of knowledge was average in 64% of the girls, good in 36%, and none of the girls had poor knowledge but in the present study, 28% of the girls had poor score, 60% had average score, and 12% of girls had good score. The difference in the score could be because of the different study stream of the participants, in the present study, the participants were arts college, whereas in their study, the students were from diploma in general nursing and midwifery and B.Sc. (Hons.) Nursing and in another study done by Pareek Pon anemia-related knowledge among adolescent girls in 2015,^[18] showed 25% of girls to be having good knowledge and 36% had fair knowledge, rest 39% had poor knowledge. The low performance could be because the students in their study were from junior college whereas the students in the present study were from degree college. In the present study, the magnitude of anemia was found to be 41% with 25% of students having mild anemia, 15% were moderately anemic, and 1% were severely anemic but a study conducted by Siva *et al.* among adolescent girls of Central Kerala in 2016^[19] showed the prevalence of anemia to be 21% with 19.1% being mild and 1.9% moderate. As the studies are from different geographical area, the difference in the prevalence of anemia could be attributed to this factor and also it can be due to difference in the participant's age group, the mean age of the girls in the present study was found to be 19.05 ± 1 years and mean age of the girls in the study by Siva *et al.* was 13.39 ± 2.3 years, here, the girls are in the early adolescence period. In a study by Chandrakumari *et al.*

Table 1: Distribution of the students based on correct and incorrect responses toward

Variable	Answers	
	Correct frequency (%)	Incorrect frequency (%)
Definition of anemia	99 (90)	11 (10)
Not consuming nutritious food is a risk factor for anemia	103 (94)	07 (06)
Is palpitation a symptom of anemia	35 (32)	75 (68)
Is easy fatigability a symptom of anemia	89 (81)	21 (19)
Can hookworm cause anemia	17 (16)	93 (84)
Is eating unwashed vegetables a risk factor for anemia	39 (36)	71 (64)
Is drinking coffee/tea be a risk factor for anemia	10 (09)	100 (91)
Do you know iron rich foods	34 (31)	76 (69)
Can iron deficiency cause anemia	56 (51)	54 (49)
Is not wearing chapel a risk factor for anemia	19 (17)	91 (83)

Table 2: Association between the age and degree of anemia among the students

Variable	Category	Anemia classification				Total	P-value
		Normal no. (%)	Mild no. (%)	Moderate no. (%)	Severe no. (%)		
Age (in years)	17–19	67 (62)	22 (20)	19 (18)	0 (0)	108	0.06
	20–22	25 (52)	17 (35)	5 (10)	1 (2)		
Total		92	39	24	1	156	

among the adolescent girls in a rural area of Tamil Nadu in 2019,^[20] overall prevalence was found to be 48.63%. Most of them were having mild degree of anemia accounting 55.6%. Although the overall prevalence found was comparable to the present study, the magnitude of mild degree anemia was high when compared to the present study. The reason might be because the criteria considered for interpretation of anemia in their study was different, the severity of anemia was graded as mild if hemoglobin was between 10 and <12 g/dl, but in the present study, hemoglobin level of 11–11.9 g/dl was considered as mild degree anemia. A study done by Kaur *et al.* among adolescent girls of rural Wardha in 2006^[21] showed prevalence of anemia to be 59.8%, whereas in the present study, the prevalence was 41%. The difference could be due to use of different methods for hemoglobin estimation. In the present study, the hemoglobin level was assessed by a point of care device called Hemocue Hb301, and in their study, the level of hemoglobin was assessed by cyanomet-hemoglobin method.

CONCLUSION

Magnitude of anemia is comparable with that of the Karnataka state and most of the anemic girls were having mild degree anemia. Nearly one-third of the students had not heard about anemia. Majority had an average knowledge on anemia and one-fourth of the students had poor knowledge. Magnitude of mild form of anemia was more among the girls in the age group of 20–22 years and moderate form of anemia was more among the girls in the age group of 17–19 years. There was no statistically significant association between age of the participants and degree of anemia.

ACKNOWLEDGMENT

The authors would like to acknowledge the Principal of Jnanavikas College, Bidadi, for their cooperation in conducting the study.

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