

Prevalence and knowledge of Anemia among adolescent girls living in selected areas of Meghalaya

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Abstract

Background: The human body contains hemoglobin, which is a red pigment present in the erythrocyte. When the hemoglobin level of an individual falls below the normal range, the individual is considered to suffer from Anemia.

Anemia is a condition characterized by low level of hemoglobin in the blood due to a number of factors like, nutritional deficiency of iron, folate, and vitamin B12.

Methods: This study is a descriptive cross-sectional study which uses Hemo check Hb strips and Interview Schedule for assessing the prevalence and knowledge of Anemia respectively.

Results: The prevalence of Anemia is found to be 26%, of which 24% of the adolescent girls have mild anemia and the remaining 2% have moderate anemia, while none of the adolescent girls have severe anemia. 44.7% of the adolescent girls have poor knowledge on Anemia, 52% have fair knowledge, 3.3% have good knowledge while

none of the adolescent girls have excellent knowledge on Anemia.

Conclusion: The overall prevalence of Anemia among the adolescent girls is 26%, and majority of the adolescent girls have fair knowledge on Anemia (52%). Based on the findings of the study, it can be concluded that there is a need to monitor supply of Iron Folic Acid (IFA) supplements through the Weekly Iron Folic Supplementation (WIFS) Programme, and a need to increase awareness programs in the form of IEC/BCC on Anemia at the community level as well as in schools, collaborating and coordinating with the parents, school teachers and staffs, healthcare workers as well as the adolescent girls.

Keywords: prevalence, knowledge, Anemia, adolescent girls, Meghalaya

Introduction

Anemia affects both the developing and developed countries, and hence is a global public health problem. It not only affects human health but has consequences on

the social as well as the economic development.^[1] WHO (2008) had estimated that 1.62 billion people are affected by Anemia.^[1] In 2019, it was found that the prevalence of anemia world-wide was at 1.8 billion.^[2] It is evident that the prevalence of anemia increased from 1.62 billion to 1.8 billion despite modern science and improved technological advancements in the field of health. This increase concludes that anemia continues to be a global burden, and if proper interventions are not being implemented and the problem is not being addressed, the prevalence may continue to rise, further paving the way for poor health condition.

Adolescence is an important time in a person's life due to the growth and development that takes place which helps to shape the adolescent into their better self. Hence, it is an opportune time to provide for interventions for Anemia in order to address it as a health problem. When the adolescents are unaware about Anemia, and also do not get the necessary education and IFA supplement, they continue to be anemic throughout.

Anemia in adolescents limit their growth and development, affects their learning ability, reduces their ability to concentrate in their daily tasks thereby decreasing their work productivity, reduces their physical fitness and hence increases their vulnerability to infections and it is also one of the cause for increase in school dropout rates.^[3]

Material and methods

Research Approach: Non-experimental research approach

Research Design: cross sectional design

Research Setting: areas under Nong krem Health and Wellness Centre

Study duration: 4 weeks

Target Population: adolescent girls aged 10-19 years

Sample Size: 150

Sampling Technique: simple random sampling

Criteria for Selection of Sample

Inclusion

- Adolescent girls between 10-19 years
- Adolescent girls present at the time of data collection

Exclusion

- Adolescent girls not willing to participate in the study
- Adolescent girls pregnant at the time of study

Data collection Tools and Technique

For assessing the prevalence of Anemia, Hemo check Hemoglobin Colour Scale was utilised to estimate haemoglobin level. This device is ISO certified.

A semi structured Interview Schedule was developed to assess the demographic profile of the adolescent girls and also to assess the knowledge of adolescent girls on Anemia. The tool used for the study consists of three parts:

- Part A: Demographic characteristics (along with personal details) of the participants
- Part B: Prevalence of Anemia
- Part C: Semi-structured Interview Schedule for knowledge of Anemia

Method of study

The study commenced after obtaining ethical clearance from the Institute Ethical Committee. Based on the inclusion and exclusion criteria's, the samples were selected for the study. These samples were given prior explanation regarding the study that was to be conducted. Informed consent or assent was then obtained. Bio physiologic method and interview schedule was carried out for each sample for a maximum duration of 30 minutes.

Based on the reading obtained from the Hemo check Hemo globin Colour Scale, the Hemoglobin (Hb) level of the participants was recorded. The classification of

Anemia was done based on the Hemoglobin level; which is of the following:

1. No Anemia (≥ 12 gm/dl)
2. Mild Anemia (10-11.9 gm/dl)
3. Moderate Anemia (7.1-9.9 gm/dl)
4. Severe Anemia (≤ 7 gm/dl)

Their knowledge score on Anemia was classified into poor, fair, good and excellent knowledge.

Analysis of the data was based on the objectives of the study using descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (Fischer’s Exact Test) using Statistical Package for Social Sciences (SPSS) ver 25.0 (SPSS Inc, Chicago, IL).

Results

Table 1: Frequency and percentage distribution of participants’ demographic characteristics. N=150

Demographic characteristics	(f)	%
Age (in years)		
10-14	58	38.7
15-17	48	32
18-19	44	29.3
Level of Education		
Class III-Class V	16	10.7
Class VI- Class X	108	72
Class XI and above	26	17.3
Occupation		
Student	128	85.3
Drop-out	18	12
Laborer	4	2.7
Mother’s Educational Level		
No schooling	8	5.3
Class I- Class V	46	30.7
Class VI- Class X	71	47.3
Class XI and above	25	16.7
Mother’s Occupation		
Housewife	50	33.3
Un-skilled workers	76	50.7

Semi-Skilled workers	24	16
BMI		
Underweight	46	30.6
Normal	92	61.3
Overweight	12	8.1
Age of attainment of menarche		
Not yet attained menarche	33	22
10-14 years	99	66
15-17 years	18	12
Number of days of menstrual flow		
Not yet attained menarche	33	22
3-6 days	110	73.3
7 days and more	7	4.7
History of deworming within 6 months of data collection		
No	76	50.7
Yes	74	49.3
Currently taking Iron Folic acid (IFA) tablets under weekly Iron Folic Supplementation (WIFS)/other	150	100
No		

Findings in Table 1, show that out of the 150 participants, 58 (38.7%) are in the early stage of adolescence i.e., 10-14 years, followed by 48(32%) in the middle stage of adolescence i.e., 15-17 years and 44(29.3%) in the late stage of adolescence i.e., 18-19 years. Majority of them, 108 (72%) are studying in class VI- class X, followed by 26(17.3%) in class XI and above and 16(10.7%) in Class III-class V.

128 (85.3%) are students, 18(12%) have dropped-out from school, and 4(2.7%) are working as laborers. 71 (47.3%) of their mothers had qualified Class VI – Class X, 46(30.7%) have qualified class I-class V, 25(16.7%) have qualified class XI and above, and only 8(5.3%) have not gone to school. 76(50.7%) of the participants’ mothers are unskilled workers, 50 (33.3%) are house wife, and 24 (16%) are semi-skilled workers.

Majority of the participants 92 (61.3%) fall under normal level of BMI, followed by 46 (30.6%) as underweight and 12 (8.1%) as overweight. 99 (66%) of the participants have attained menarche at the ages between 10-14 years, 33 (22%) have not yet attained menarche, and 18 (12%) attained menarche between 15-17 years. Out of these 150.

majority of them, 110 (73.3%) have menstrual flow between 3-6 days, 33(22%) have no menstrual flow as they have not yet attained menarche, 7(4.7%) have their menstrual flow for 7 days and more. Majority 76 (50.7%) of the participants had no history of deworming within 6 months of data collection and the remaining 74(49.3%) had history of deworming within 6 months of data collection.

All of the participants, 150 (100%) are not consuming Iron Folic Acid (IFA) tablets under Weekly Iron Folic Supplementation (WIFS)/other.

Table 2: Frequency and percentage distribution of prevalence of Anemia among adolescent girls. N=150

Prevalence of anemia	Level of hemoglobin (in gm/dl)	(f)	%
No anemia	≥12	111	74
Mild anemia	10-11.9	36	24
Moderate anemia	7.1-9.9	3	2

Findings in Table 2 show that, out of the 150 adolescent girls, 111 (74%) were not anemic, 36 (24%) were mildly anemic, and 3 (2%) were moderately anemic.

Thus, making the prevalence of Anemia to 39 (26%).

Table 3: Descriptive analysis of the level of knowledge score of the adolescent girls. N=150

Level of knowledge score	Range of score obtained	(f)	%	Mean	Standard deviation
Poor	0-5	67	44.7	6	2.22

Fair	6-10	78	52		
Good	11-15	5	3.3		
Excellent	≥16	0	0		

Table 3 shows the range of score obtained by participants out of maximum possible score of 20. Poor knowledge score indicates score within 0-5 marks, fair knowledge within 6-10 marks, good knowledge within 11-15 marks and excellent knowledge scoring ≥16. Majority of the adolescent girls 78(52%) have fair knowledge on Anemia, 67 (44.7%) have poor knowledge on Anemia, only 5(3.3%) have good knowledge on Anemia while none of the adolescent girls had excellent knowledge on Anemia. The above table also shows the mean knowledge score of the adolescent girls on Anemia is 6 ± 2.22, which indicates that the data was normally distributed. Hence, Fischer’s Exact Test was utilized for the inferential statistics. The knowledge score of 6 ± 2.22 also indicates that majority of the adolescent girls have fair level of knowledge score on Anemia.

Fig 1: A bar diagram showing area wise mean percentage of knowledge score of adolescent girls on Anemia. N=150

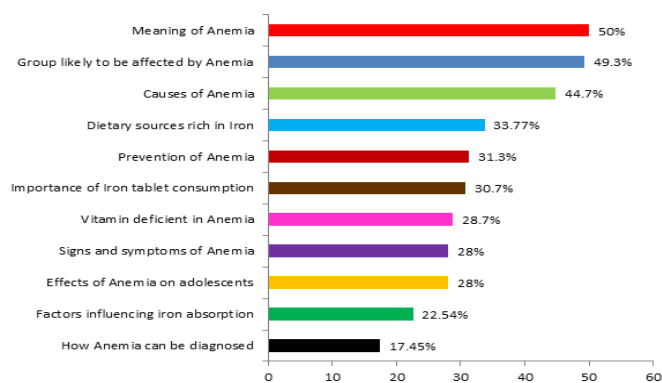


Fig 1 shows that, when area wise knowledge on Anemia is assessed, it is found that the mean percentage for the knowledge score regarding meaning of Anemia is 50%. For the group likely to be affected by Anemia the mean percentage is 49.3%, and causes of Anemia is 44.7%. The dietary sources rich in iron has a mean percentage of

33.77%, and prevention of Anemia is 31.3%, and importance of iron tablet consumption is 30.7%. The mean percentage for vitamin deficient in Anemia is 28.7%. The signs and symptoms of Anemia has a mean percentage of 28%, and that of effects of Anemia on adolescents is 28%. The mean percentage for factors

influencing iron absorption is 22.54% and how anemia can be diagnosed is 17.45%. It can be concluded that, the adolescent girls have highest knowledge on the meaning of Anemia and the lowest knowledge on how Anemia can be diagnosed.

Table 4: Association between prevalence of Anemia among the adolescent girls with selected demographic variables.

N=150

Demographic variables	Prevalence of anemia			Fischer's exact calculated value (p-value)
	No anemia	Mild anemia	Moderate anemia	
AGE (in years)				
10-14	45	13	0	0.63
15-17	35	12	1	
18-19	31	11	2	
Education				
Class III-Class V	12	4	0	0.69
Class VI-Class X	82	24	2	
Class XI and above	17	8	1	
Occupation				
Student	94	31	3	0.79
Drop-out	13	5	0	
Laborer	4	0	0	
Mother's education				
No schooling	5	2	1	0.33
Class I-Class V	35	10	1	
Class VI-Class X	55	15	1	
Class XI and above	16	9	0	
Mother's occupation				
Housewife	35	14	1	0.76
Unskilled	59	15	2	
Semi-skilled	17	7	0	
Bmi of the participants				
Underweight	31	13	2	0.12
Normal	68	23	1	
Overweight	12	0	0	
History of deworming				
YES	52	20	2	0.54
No	59	16	1	

Age of attainment of menarche				
Not yet attained menarche	26	7	0	0.19
10-14 years	73	25	1	
15-17 years	12	4	2	
Number of days of menstrual flow				
Not yet attained menarche				0.29
3-6days	26	7	0	
≥7 days	82	25	3	
	3	4	0	

p-value ≤0.05 level of significance

Table 4 shows the findings of association between prevalence of anemia with the selected demographic variables. The data were computed with the help of IBM SPSS 25.0 ver. There is no significant association between age, education, occupation, mother's education,

mother's occupation, BMI of the participants, history of deworming, age of attainment of menarche and number of days of menstrual flow at p value ≤0.05 level of significance. Hence, we fail to accept the research hypothesis. Hence, we fail to reject the null hypothesis.

Table 5: Association between knowledge on Anemia among the adolescent girls with selected demographic variables. N=150

Demographic variables	Level of knowledge			Fischer's exact calculated value (p-value)
	Poor	Fair	Good	
AGE (in years)				0.14
10-14	33	23	2	
15-17	13	34	1	
18-19	21	21	2	
Education				0.45
Class III-Class V	9	7	0	
Class VI-Class X	49	56	3	
Class XI and higher	9	11	2	
Occupation				0.35
Student	55	69	4	
Drop-out	11	6	1	
Laborer	1	3	0	
Mother's education				0.50
No schooling	4	3	1	
Class I- Class V	21	24	1	
Class VI-Class X	28	40	3	
Class XI and higher	14	11	0	
Mother's occupation				0.63
Housewife	25	23	2	

Unskilled	34	40	2	
Semi-skilled	8	15	1	
History of deworming				
Yes	35	35	3	0.25
No	32	43	1	

p-value ≤ 0.05 level of significance

Table 5 shows association between level of knowledge on anemia with selected demographic variables. The data were computed with the help of IBM SPSS 25.0 ver. There is no significant association between age, education, occupation, mother’s education, mother’s occupation and history of deworming at p value ≤ 0.05 level of significance. Hence, we fail to reject the null hypothesis.

Discussion

In the present study, the prevalence of Anemia among 150 adolescent girls between the ages of 10-19 years is 26%, of which 24% are mild anemia, and 2% are moderate anemia. Similarly, a study carried out by Kumar A et al (2018) in selected schools located in Jorhat among 340 adolescent girls of the age group 12 to 18 years reported that, the prevalence of anemia was 39%, of which 27.9% were mild anemia, 10.6% were moderate and 0.5% were severe anemia.^[4] None of the participants of the present study are found to be classified as severe anemia which was similar with the study conducted by Upadhye JV et al (2017) in Tip Top Convent School, Nagpur on 300 girls between 12-16 years of age which revealed that none of the subjects under study had severe anemia.^[5]

In the present study, the mean knowledge score is found to be 6 ± 2.22 . On the contrary a study conducted by Aji GK et al (2016) in Pandeglang among adolescent girls concluded that the average score of knowledge about anemia was 67.3 ± 12.47 .^[6]

The present study reports that, majority of the adolescent girls (52%) had fair knowledge on Anemia, followed by 44.7% having poor knowledge and 5% having good knowledge. This is similar with the study conducted by Priyalatha M (2020) in UAE among school going adolescent girls of classes 8th and 9th, in which the highest level of knowledge was moderate knowledge (89.5%), followed by low knowledge (9.8%) and good knowledge (0.8%).^[7]

In the present study, there is no significant association between prevalence of Anemia with selected demographic variables which is similar to a study conducted by Kumar A et al (2017) in Jorhat which reported that age, status of menarche, BMI and education did not contribute significantly to the prevalence of Anemia.^[4] However, a study conducted by Upadhye JV et al (2017) in Nagpur found a statistically significant association of anemia with the mother’s educational status (p<0.001 significant).^[5]

The present study depicts that there is no association between the knowledge on anemia with the selected demographic variables. This is in line with a study conducted by Johnson N et al (2016) in Mangaluru on adolescent college girls which reported that there was no significant association between knowledge score and the selected demographic variables.^[8]

Conclusion

As per the World Health Organization Classification of anemia as a problem of public health significance denotes that “20%-39.9% categorises as a moderate public health problem”^[1] Hence, the study concludes that

anemia is a moderate public health problem in the selected areas of the present study.

When the adolescents have good knowledge about Anemia, they are able to develop healthy practices towards prevention of Anemia and as a result the prevalence of Anemia would likely be reduced. When its prevalence reduces, a time may come where it ceases to be a major public health issue but only as an existing health issue. Hence the findings of this study can be utilized to pave the way for further research studies on the subject of interest.

This study concludes that, though the prevalence of Anemia was less (26%) as compared to other literature review, majority of the participants had only fair level of knowledge score on Anemia. "Ignorance is bliss" is not always true. Possessing only fair knowledge on Anemia actually puts the adolescents at greater vulnerability for the same as they are not aware about the preventive measures which would help save their live. The study also did not find any statistically significant association between the prevalence and knowledge of Anemia with selected demographic variables.

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Author profile

Julana Lapasam completed her BSc (N) from College of Nursing NEIGRIHMS. After her graduation, she worked as a Staff Nurse posted in the community set-up for a period of almost 2 years in Ri-Bhoi District, an aspirational district of Meghalaya. She then pursued her post-graduation in her alma mater in the specialisation of Community Health Nursing. She aspires to continue research work that would prove beneficial to the society.