

A Cross Sectional Study among Adolescent School Going Girls to Know Prevalence of Anemia and Factors Contributing it

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Abstract

Background: Anemia is present when there is less levels of Hb% as per age and sex. Iron-deficiency anemia is the most common and intractable national problem of adolescent girls.

Aim: To study prevalence & factors contributing to anaemia among adolescent school girls in secondary/ Higher secondary school of Purnea.

Material and Methods: A cross sectional study was done among 260 school going adolescent girls (10-19Yrs) of government schools in Purnea region from July 2022 to September 2022. Two study groups were selected from two different girls' school by random sampling method. Haemoglobin status of the study subjects were measured in the school. Data like Education of mother, Family size, SES, dietary habits, anaemia related knowledge, WIFs use, menstrual pattern, duration of menses, Hand washing practices etc among adolescents' girls were collected by interview method and Statistical analysis were done by Microsoft Excel & SPSS software version 26.

Result & Conclusion: The prevalence was 41% among adolescent schoolgirls. Prevalence of anemia was dependent on the knowledge about prevention of anemia, literacy level, food habits like frequency of Iron rich source viz. green leafy vegetable & non vegetarian diet, WIFs use, Sanitation etc.

Keywords: Anemia, Adolescent girls, Hemoglobin

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Introduction

Adolescence is the period, where rapid growth and visible changes are witnessed in terms of physical, mental, intellectual, emotional, psychological, and behavioral patterns. And during such rapid changes in physical growth they are also prone to Anemia. Anemia caused by lack of Iron reach

diet or Iron deficiency is a problem of both national & global concern [1]. It has major effect on human health as well as economic burden of the country [2,3]. The prevalence of this is more among pregnant women and young children. According to WHO & in developing countries the prevalence of

anemia among pregnant women averages 56%, ranging between 35 to 100% among different regions of the world [4]. The prevalence of anemia from various regions of the country (India) have shown that it lies between 33 and 100% [5]. The anemia is not confined to only diseased person rather it is more prevalent among healthy population especially adolescent girls. [6] These groups are the vulnerable to anemia because iron requirements is increased for body growth, mental growth and sexual growth. Despite other cause there is extra loss of blood due to menstruation and sometimes more due to other pathological cause [7,8]. In India, it is estimated that about 56% of the Adolescent girls are prone to Anemia, which means at any given point of time about 6.40 Crore adolescent girls are suffering from Anaemia. Study conducted in different states of India has revealed the prevalence of anemia differently. [9]

In the present study school going adolescent girls are chosen because managing the problem of anemia & bringing awareness among adolescent girls, maternal morbidity & mortality especially for future pregnancy can be improved. There are only few studies in this region addressing Anemia of adolescent school girls. In view of the above, present study was carried out to find out the prevalence of anemia and various factors associated with anemia like Knowledge of Anemia, Menstrual Pattern, Dietary pattern, WIFs intake pattern etc. amongst adolescent girls.

Material and Methods

This is a cross-sectional study which was done from July 2022 to September 2022 among school going adolescent girls (10-19Yrs) at government schoolgirls of Purnea. Two study groups were selected from two different girls' school by random sampling method. Group of 130 adolescent girls each from two schools were selected after taking

willingness to participate in the study from parents & study subjects. Ethical approval for the study was obtained.

Inclusion and exclusion criteria: Girls of adolescent age group between 10 and 19 years who were willing to take part in this study were taken. Secondly who gave consent for the same and who were present on the day of visit in the school were included in this study while those adolescent girls who were not willing to take part / not given consent were excluded from this study. Third, who were having any kind of disease like bleeding piles, blood disorder were also excluded.

Sample size determination: The sample size of the present study were calculated using a formula $4PQ/L^2$, where $P=0.56$ (proportion of sample who are assumed to have anemia, taken from pilot study), $Q=(1-P)$ $L=$ Precision error(12%). The estimated sample size was calculated to be 260 by considering 10% nonresponsive error.

Study Population: Study has been conducted in adolescent girls of Government Secondary/ Higher secondary school of Purnea.

Period of Study: The study has been carried out from July 2022 to September 2022 after a pilot study. Collection of data, Data analysis and presentation of findings done.

Sampling Technique: Simple random sampling technique was used to select the requisite sample size.

Data collection method: The questionnaire framed for this study was semi-structured and pretested. This was used to get information related to socio-demographic characteristics, WIFs use, Anemia related knowledge, educational level of mothers, dietary pattern, family size, family income, menstrual period, hand washing practices etc among adolescents' girls.

Hemoglobin measurement: Haemoglobin status of the study population was measured by Digital Hemoglobinometer by using capillary blood. Aseptic measures were taken during pricking of the fingers to take blood for testing Hb%. For this, fingertip were rubbed with sterile cotton soaked in spirit, a drop of blood sample was collected by finger pricking with a sterile disposable lancet and the second blood drop was taken for hemoglobin measurement. Within a minute the result was noted in black and white. Hemoglobin level determination was done by trained laboratory technicians. Anemia status of adolescent girls was assessed using the WHO (World Health Organization) classification. An individual adolescent girl was considered anemic if the Hb value was below 12.0g/dL. Girls having anemia were further categorized into different grades such as mild (10–12g/dL), moderate (7–9.9g/dL)

and severe (Less than 7g/dL) .

Statistical analyses: The analysis was conducted using Microsoft Excel & SPSS software version 26. Tables, graphs, means, and frequencies were used to present descriptive results. Odds Ratio (OR) was performed to test the association between hemoglobin and independent variable.

Results

In the present study, total 260 adolescent girls participated with a very good response rate of 100%. The mean age with standard deviation of the adolescent girls were 14.26 ± 2.3 yrs.

In the present study prevalence of anemia was 41% amongst study population. 25% had mild anemia, 11% had moderate anemia whereas 5% had severe anemia. Prevalence have been shown in Fig:1

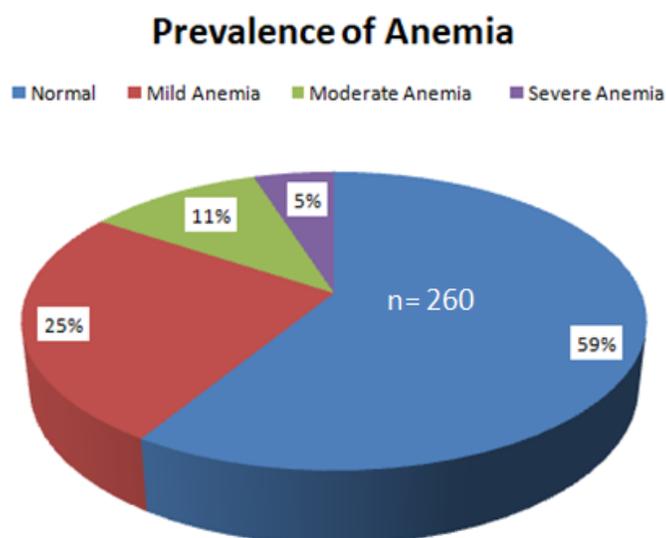


Figure 1: Prevalence of Anemia

Hemoglobin level of all the 260 study subjects have been shown in the fig:2 by scatter diagram. Left side of the diagram shows the Anemic population whereas right side i.e. 59% shows normal Hemoglobin of the study population. Mean hemoglobin level with a standard deviation of the adolescent girls were 11.4654 ± 1.98 .

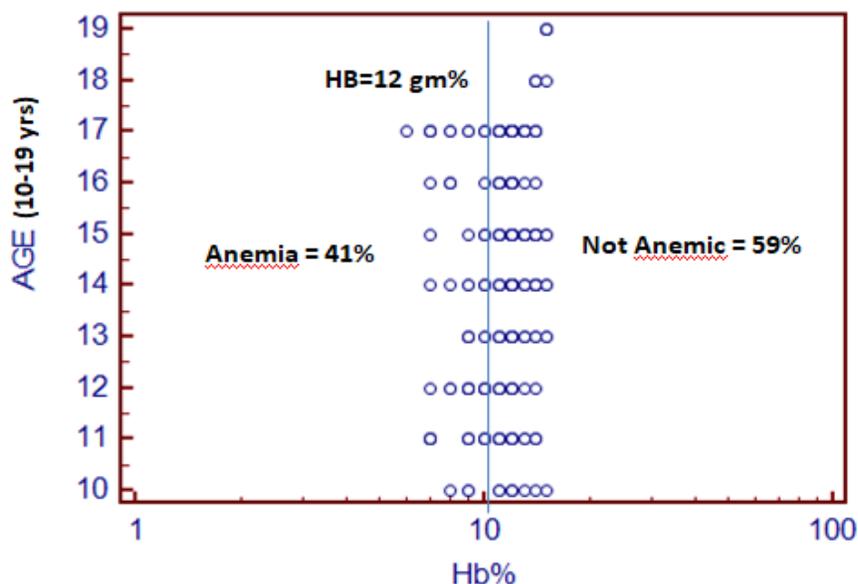


Figure 2: Age wise distribution of Hemoglobin

Factors associated with anemia: Prevalence of anemia was associated with education of mother. The adolescent girls whose mother had any type of formal or informal education had less anemia. The family who were in BPL category of Income level had more chance of Anemia. Those who had taken diet rich in Iron had less anemia. The adolescent girls who had longer duration of menses more than 5 days had more anemia. Adolescent girls who were regularly using WIFs had less anemia prevalence. Good hand washing practice had also significance with normal Hemoglobin level. Family size and Menstrual pattern have less significance with the association of Anemia. (Table:1)

Table 1: Factors associated with Anemia

S.No	Factors	Description	Anemia	Not Anemic	O.R (95%CI)	P Value
1	Education of Mother	Illiterate	71	45	6.5083 (3.3583 to 12.6131)	P < 0.0001
		Informal Ed	20	42		
		Formal Edu	16	66		
2	Family Size	≤4	43	96	0.3989 (0.2403 to 0.6622)	P = 0.0004
		≥5	64	57		
3	Income	BPL	21	51	0.4884 (0.2725 to 0.8754)	P = 0.0161
		No BPL	86	102		
4	Iron reach Diet	Adequate	27	104	0.1590 (0.09148 to 0.2764)	P < 0.0001
		Poor	80	49		
5	Knowledge of Anemia	Adequate	29	110	0.1453 (0.08359 to 0.2527)	P < 0.0001
		Poor	78	43		

6	Menstrual Pattern	No Menses	15	20	1.1982 (0.6985 to 2.0554)	P = 0.5113
		Irregular	40	52		
		Regular	52	81		
7	Duration of Menses	≤4 Days	52	119	0.1529 (0.07668 to 0.305)	P < 0.0001
		≥5 days	40	14		
8	Intake of WIFs	Irregular/Poor	70	5	56.0000 (21.097 to 148.645)	P < 0.0001
		Regular/Good	37	148		
9	Hand Washing	Good	46	112	0.2761 (0.1635 to 0.4662)	P < 0.0001
		Poor	61	41		

Discussion

This is known from various studies that prevalence of anemia is high in developing countries; it is estimated that 9 out of 10 anemia cases reside in developing countries. [10] And in India, it is estimated that about 56% of the Adolescent girls are prone to Anemia.[9] .The finding of the present study shows that the overall prevalence of anemia among school adolescent girls was calculated to be 41% in Purnea region . The prevalence of anemia among adolescent girls are consistent with the prevalence girls in Karnataka i.e. 41.5%. [9] The possible reason for improvement in anemia profile as compared to national figure, in this region might be due to WIFs supplementation program. And in a study by Aggarwal *et al.*, conducted among adolescent girls in the North East Delhi showed 45% prevalence of anemia. [11] But our study shows slightly lower prevalence rate, and it might be due to advancement with environmental factors, educational level etc with course of time.

In the present study it was seen that the adolescent girls belonging to lower socioeconomic groups (BPL) had high prevalence (P = 0.0161) of anemia than the girls belonging to higher socioeconomic groups in the same setting. These findings were concordant with other similar studies conducted to study anemia among girls

belonging to Nagpur, Chandigarh, Uttar Pradesh, and Delhi, showing high prevalence rate among lower socioeconomic groups. [12-15].

A study in eastern Ethiopia has shown that nutritional problems among the high-risk groups like pregnant women, children, and adolescent girls can be managed effectively by reducing family size. Small family size will give chance of adequate nutritious foods to make available, ultimately the health of the family will be improved [16,17] in line with this, the current study showed that adolescent girls from family size having ≥5 people were more likely to be anemic [P = 0.0004].

Adolescent girls having longer duration of menses had high prevalence (P < 0.0001) of anemia than the girls having shorter one. This is concordant with the Turkish study of prevalence of anemia where the ferritin level and physical functions were found to decrease significantly as the duration of menstruation increased ($p < 0.05$) [18].

Anaemia was more amongst those who were not compliant to WIFS tablets in a study conducted at Puducherry, India [19] which is similar to the current study. It revealed that adolescent girls who regularly used WIFs had less prevalence of Anemia (P < 0.0001). Lower educational level of mother have

significance with anemia ($P < 0.0001$) which is concordant with other similar studies conducted to study anemia at China. The study showed that Adolescents whose mothers had completed high school were 0.35 (95% CI 0.13, 0.93) times less likely to be anemic, compared to those of whom had < 3 years of formal education [20].

Conclusion and Recommendation

The overall prevalence of anemia among adolescent school girls in Purnea as per the study above is 41%. The statistical significance of Anemia is found with the factors like low educational level of mothers, iron deficiency diet Big family size, Low family income, lack of knowledge regarding anemia, longer menstrual period, Lack of hand washing practices & Irregular use of WIFs provided by school etc. Modifiable factors which are beneficial is to be adopted to prevent iron deficiency Anemia in girls before they enter into adolescent age group and during adolescence period. There is finally need for regular supply of Iron and Folic acid tablets at school and to increase the compliance regarding consuming tablets among adolescent girls. School-going adolescent girls should be educated with IEC & BCC activities that will provide a vital role in the prevention and control of anemia among this group.

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