Prevalence and Perceived Causes of Nutritional Anemia Among Adolescent Girls

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ABSTRACT

Nutritional anemia is a disorder that cause due to a lack of one or more vital nutrients, such as iron, protein, vitamin B12, and other vitamins and minerals. The hemoglobin content in the blood is lower than usual. 1. To assess the prevalence of nutritional anemia among adolescent girls. 2. To assess perceived causes of nutritional anemia among adolescent girls. 3. To associate the demographic variable with prevalence and perceived causes of nutritional anemia among adolescent girls. A cross sectional study was conducted among adolescent girls were age of 10 to 15 years, the sample size can be calculated statistically by using the prevalence of previous studies and the sample size was 220 adolescent girls selected in a particular community area from Wardha district. Ethical approval was obtained from IEC, DMIMS (DMIMS (DU)/IEC/Aug-2019/8685). The sample collection was done by using non-probability convenience sampling. The portable hemoglobinometer (Accusure HB meter) used for analyzing the Hb level and structure questionnaire scale was formulated on the basis of the causes behind the nutritional anemia. Prevalence of nutritional anemia among adolescent girls was found 56.4%. Within that 17.3% of them had mild anemia, 35.5% of them had moderate anemia and 3.6% of them had severe anemia. The perceived causes of nutritional anemia was found, 4.03% of adolescent girls have genetic history of any type of anemia, 9.68% of them had a history of heavy menstrual flow, 10.48% of them were suffering from chronic disease in past or more than 3 months in the recent year time, 91.94% of them think that they are taken inadequate intake of iron in the food, 0.81 % had a hookworm infection, 25% of them replied that drink coffee or tea will decrease iron absorption, 89.52% of them take diet low in fruits, vegetable and cereals, 38.71% of the adolescent girls always eat overcooked food, 4.84% of them take any type of medicine and 19.35% of the adolescent girls eat junk food. Conclusion: This study finding shows that the demographic variables is shows significant association between the prevalence of nutritional anemia with educational status of caretakers. In association with the perceived causes of nutritional anemia shows significant association with type of diet.

KEY WORDS: PREVALENCE, PERCEIVED CAUSES, NUTRITIONAL ANEMIA, ADOLESCENT GIRLS.

INTRODUCTION

Nutritional anemia is a disorder that cause due to a lack of one or more vital nutrients, such as iron, proteins, vitamin B12 and other vitamins and minerals. The hemoglobin content in the blood is lower than usual. 1 All pathological conditions in which the concentration of

blood hemoglobin falls to an abnormally low level due to the deficiency of one or more nutrients are described by the word nutritional anemia. Iron, folic acid, and vitamin B12 are the principal elements needed in hemoglobin synthesis. 2 Nutritional anemia in children has been shown to be associated with decreased emotional, physical and cognitive health and is a potential cause for maternal mortality rates. 3 Anemia is characterized by hemoglobin (Hb) levels of < 12.0 g/dL in women and < 13.0 g/dL in men, according to the World Health Organization. 4 Anemia is a major global health issue, particularly in developing countries.

This basic health problem is yet to be resolved, and it threatens to impact the health, quality of life, and working capability of billions of people worldwide. 5 Anemia

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impacts 1.62 billion people worldwide. This gap has been filled by the WHO Global Database on Anemia, data from 93 different countries. In the case of preschool-age children, data from as many as 76 percent of the population was analyzed and used to create statistical models to produce national prevalence estimates for countries. The highest prevalence is 47.4 percent in preschool-aged girls, and the lowest prevalence is 12.7 percent in adults. Non-pregnant women, on the other hand are the demographic group with the largest number of people affected (Cappellini 2015).

6 As compared to other developing countries, the prevalence of anemia in all classes is higher in India. Anemia affects in India around 50% of the population. As more women are affected by it than men, the issue becomes more severe. It is reported that about 20 percent to 40 percent of maternal deaths in India are due to anemia, and some form of anemia affects one in every two Indian women (56 percent). Anemia in females is characterized as less than 12 g/dL hemoglobin. Mild anemia is characterized as a level of 10-11.9 g/dL of hemoglobin, moderate anemia as a level of 7-9.9 g/dL of hemoglobin, and extreme anemia as a level of less than 7 g/dL of hemoglobin among women. Studies by the Indian Council of Medical Research (ICMR) and the District Level Household Survey (DLHS) have shown that the prevalence of anemia in pre-school infants, pregnant and lactating mothers, and teenage girls is very high (ranging from 80->90%).

In particular, low birth weight babies, young children and women of childbearing age are at risk for anemia. This is how anemia starts in infancy, worsens in girls during puberty, and gets worse during pregnancy. In India, teenage girls, who make up a significant segment of the population, are a vulnerable group at higher risk of morbidity and mortality. Due to increased demand for iron for hemoglobin, myoglobin and to make up for iron loss due to menstruation and poor dietary habits. Teenage girls are especially vulnerable to iron deficiency anaemia.⁷ The rapid physical, psychological and cognitive growth defines the adolescent phase. In the human lifespan, adolescent age is a vulnerable time for the development of anemia. Adolescents cover almost one tenth of the population in India and constitute a vital sector of the population in society (Benoist et al., 2005).

Present and future well-being of the adolescent can depend on their current nutritional status. The teenage age is the important years of growth, anemia has some long-term effects at this stage of life, such as growth retardation, poorer academic results, decreased immunity, irregular menstrual cycles, and later poor birth complications such as intrauterine growth restriction, birth defects, increased perinatal morbidity, and mortality. The most common nutritional condition globally is anemia. Because of the requirements for rapid growth and menstrual blood loss, anemia is normal in teenage girls. The WHO reports shows the prevalence of

anemia among teenage girls in developing countries at 27 percent and in developed countries at 6 percent.

Objectives of the Study

1. To assess the prevalence of nutritional anemia among adolescent girls.
2. To assess the perceived causes of nutritional anemia among adolescent girls.
3. To associate the demographic variable with prevalence and perceived causes of nutritional anemia among adolescent girls.

MATERIAL AND METHODS

A cross sectional study was conducted among adolescent girls were age of 10 to 15 years, the sample size can be calculated statistically by using the prevalence of previous studies and the sample size was 220 adolescent girls selected in a particular community area from Wardha district. Ethical approval was obtained from IEC, DMIMS (DMIMS (DU)/IEC/Aug-2019/8685). The sample collection was done by using non-probability convenience sampling. The portable hemoglobinometer (Accusure HB meter) used for analyzing the Hb level and structure questionnaire scale was formulated on the basis of the causes behind the nutritional anemia. The investigator inspected the selected community in the Wardha district and received the permission needed from the authorities concerned (Chaudhary & Dhage 2008).

In order to ensure better cooperation during the data collection, the investigator introduced herself and told them about the purpose of the research. The investigator approached the adolescent girls from age between 10-15 years in selected community and explained the purpose of the study and explained how it will be beneficial for them. The investigator took the consent from individual adolescent girls for the study. The investigator personally visited each adolescent girl, and provide orientation about the study and also administered structured questionnaire to them. Investigator instructed them not to interact with each other, doubts were clarified. A good rapport was maintained. On the first day, each participant was given a questionnaire. The questionnaires were collected soon after it was filled up. On the same day the Hb estimation was done by using portable Hemoglobinometer. After that those girls found anemic fill the structured questionnaire regarding perceived causes of nutritional anemia and collect all the forms. Given a health education Regarding Diet.

Statistical Analysis: The descriptive and inferential statistics was done by using SPSS 23 software. A master sheet will be prepared by the investigator to measure the data. Using frequency and percentage, baseline Performa containing sample characteristics was analyzed. Prevalence of nutritional anemia among adolescent girls, demographic variable, perceived causes of nutritional anemia can be calculated by using mean, mean percentage and standard deviation. The

significance of the variance between the prevalence of nutritional anemia and demographical variables were calculated using “t” test. The significance of the variance between the prevalence and perceived causes of nutritional anemia were calculated using “t” test. The correlation between prevalence of nutritional anemia and demographical variables were determined by ANOVA and unpaired “t” test.

RESULTS AND DISCUSSION

Percentage wise distribution of adolescent girls according to their demographic characteristics. The above table no.1 shows that total 15.50% of the adolescent girls were of 10 years, each 12.70% were of 11 years and 13 years, 15.90% were of 12 years, 19.50% of 14 years and 23.70% of adolescent girls were of 15 years of age. Among all adolescent girls 28.20% of the adolescent girls were educated upto 4-5th standard, 27.70% upto 6-7th standard, 41.40% of them were educated upto 8-9th standard and 2.70% of the adolescent girls were educated upto 10th standard. Minority 0.50% of the caretakers of adolescent girls were illiterate, 10% of them were educated upto primary standard, 12.30% of them were educated upto secondary standard, 23.20% of them were educated upto SSC, 24.40% of them were educated upto HSC, 19.10% of them were upto under graduation and 10.50% of the adolescent girls were educated upto graduation and above.

Out of 220, 52.30% of the adolescent girls were having monthly family income of 5001-10000 Rs, 37.20% were having between 10001-15000 Rs, 8.20% were having monthly family income of 15001-20000 Rs and only 2.30% of the adolescent girls were having monthly family income of 20001 Rs and above. 50% of the adolescent girls were from joint families, 46.40% of them were from nuclear families and 3.60% of them were from extended families. 35% of the adolescent girls were vegetarian, no one is non-vegetarian.

Assessment with prevalence of nutritional anemia: The above table no.2 and figure no.1 shows that 43.6% of adolescent girls had no anemia, 17.3% of them had mild anemia, 35.5% of them had moderate anemia and 3.6% of them had severe anemia. Overall prevalence was 56.4%.

Assessment with perceived causes of nutritional anemia among those adolescent girls are anemic: The above table no.3 and figure no.2 shows that 4.03% of adolescent girls have genetic history of any type of anemia, 9.68% of them had a history of heavy menstrual flow, 10.48% of them were suffering from chronic disease in past or more than 3 months in the recent year time, 91.94% of them think that you have taken inadequate intake of iron in the food, 0.81 % had a hookworm infection, 25% of them replied that drink coffee or tea will decrease iron absorption, 89.52% of them take diet low in fruits, vegetable and cereals, 38.71% of the adolescent girls always eat overcooked food, 4.84% of them take any

Table 1. Percentage wise distribution of adolescent girls according to their demographic characteristics.

Demographic Variables	No. of adolescent girls	Percentage (%)
Age(yrs)		
10 yrs	34	15.5
11 yrs	28	12.7
12 yrs	35	15.9
13 yrs	28	12.7
14 yrs	43	19.5
15 yrs	52	23.7
Education of adolescent girls		
4-5thstd	62	28.2
6-7thstd	61	27.7
8-9thstd	91	41.4
10thstd	6	2.7
Education of caretakers		
Illiterate	1	0.5
Primary	22	10.0
Secondary	27	12.3
SSC	51	23.2
HSC	54	24.4
Undergraduate	42	19.1
Graduate and above	23	10.5
Monthly family income(Rs)		
5001-10000 Rs	115	52.3
10001-15000 Rs	82	37.2
15001-20000 Rs	18	8.2
20001 Rs and above	5	2.3
Type of family		
Joint	110	50.0
Nuclear	102	46.4
Extended	8	3.6
Type of diet		
Vegetarian	77	35.0
Non Vegetarian	143	65.0
Mixed	0	0.0

type of medicine and 19.35% of the adolescent girls eat junk food. Association of prevalence of nutritional anemia among adolescent girls

This table no.4 shows the association of prevalence of nutritional anemia with demographic variable of adolescent girls. There is significant association with educational level of caretakers of adolescent girls. The tabulated ‘ χ^2 ’ values was 28.87 (df=18) which is much less than the calculated ‘ χ^2 ’ i.e. 72.73 at 5% level of significance. Also the calculated ‘p’=0.0001 which was much less than the acceptable level of significance i.e. ‘p’=0.05. Hence it is interpreted that educational

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significance. Also the calculated ' p '=0.0001 which was much less than the acceptable level of significance i.e. ' p '=0.05. Hence it is interpreted that educational level of caretakers of adolescent girls is statistically associated with prevalence of nutritional anemia.

Table 2. Assessment with prevalence of nutritional anemia

Prevalence of nutritional anemia	Score Range	Level of perception Score	
		No of adolescent girls	Percentage
No anemia	<12 gm/dl	96	43.6
Mild anemia	11-11.9 gm/dl	38	17.3
Moderate anemia	8-10.9 gm/dl	78	35.5
Severe anemia	<8 gm/dl	8	3.6
Total	220	100	

Figure1: Assessment with level prevalence of nutritional anemia

Figure 2: Assessment with perceived causes of nutritional anemia among those adolescent girls are anemic

Association of perceived causes of nutritional anemia among adolescent girls: This table no.5 shows the association of perceived causes of nutritional anemia with demographic variable of adolescent girls. There is significant association of perceived causes of nutritional anemia with type of diet of adolescent girls. The tabulated ' F ' values was 1.98 (df=122) which is much less than the calculated ' F ' i.e. 2.14 at 5% level of significance. Also the calculated ' p '=0.034 which was much less than the acceptable level of significance i.e. ' p '=0.05. Hence it is interpreted that type of diet of adolescent

girls is statistically associated with perceived causes of nutritional anemia (Meenal et al., 2012).

The study was conducted to assess the prevalence and perceived causes of nutritional anemia among adolescent girls, the study was conducted among 220 adolescent girls in selected community area. In this study cross sectional survey design adopted. Hb estimation done by portable hemoglobinometer (Accusure HB meter) and interpretation done on WHO cut off value. Mild anemia >11gm/dl to <11.9gm/dl, moderate anemia >8gm/dl to <10.9gm/dl and severe anemia < 8gm/dl. Out of 220 adolescent girls that 43.6% of adolescent girls had no anemia, 17.3% of them had mild anemia, 35.5% of them had moderate anemia and 3.6% of them had severe anemia. Prevalence of nutritional anemia among adolescent girls was 56.4% (Khokhar 2012 & Kotecha 2011).

A similar cross-sectional study was conducted in western Maharashtra among 300 female students those studying at a health institute in western Maharashtra Their general information, knowledge about anemia signs and symptoms, and dietary patterns are all elicited using a standardized questionnaire. Using the spectroscopy process, each participant's basal metabolic index and hemoglobin are calculated. The result showing anemia rate of 86 percent (28.6 percent), according to the severity of anemia, approximately 54 (18%) had mild anemia and 32 (10.6%) had severe anemia (Mayura et al., 2014).

Another similar study done to assess the prevalence of anemia in girls who live in urban slum at Jaitala, Nagpur from 2009 June to 2010 February. The participants are the 272 adolescent girl's age between 10 to 19 years. The prevalence of anemia is found 90.1% in girls. 88.6 per cent of the majority of girls had mild to moderate anemia and just 1.5 per cent of girls were seriously anemic. Overall mean hemoglobin level was 10.33 ± 1.34 . 10 Prevalence of anemia associate with education of caretaker. This present study show the association between the prevalence of nutritional anemia of adolescent girls with education of caretaker

were significant i.e. $p = 0.0001$. Hence it is interpreted that there was significant association with education of caretaker which explains its higher prevalence in high educated family (Melwani et al., 2018).

Table 2. Association of prevalence of nutritional anemia among adolescent girls n=220

Demographic variables	Frequency	No Anemia	Mild anemia	Moderate anemia	Severe anemia	χ^2 -value	df	χ^2 -tab value	p-value
Age (yrs)									
10 yrs	34	12	9	12	1	12.73	15	24.99	0.62, NS, p>0.05
11 yrs	28	14	5	8	1				
12 yrs	35	14	4	16	1				
13 yrs	28	13	4	9	2				
14 yrs	43	24	3	15	1				
15 yrs	52	19	13	18	2				
Education of adolescent girls									
4-5 th std	62	26	14	20	2	7.55	9	16.92	0.58, NS, p>0.05
6-7 th std	61	27	8	23	3				
8-9 th std	91	41	13	34	3				
10 th std	6	2	3	1	0				
Education of caretakers									
Illiterate	1	0	0	1	0	72.73	18	28.87	0.0001, S, p>0.05
Primary	22	6	1	12	3				
Secondary	27	2	6	17	2				
SSC	51	12	15	21	3				
HSC	54	26	12	16	0				
Undergraduate	42	32	2	8	0				
Graduate and above	23	18	2	3	0				
Monthly Income (Rs)									
Rs. 5001-10000	115	48	18	42	7	11.27	9	16.92	0.25, NS, p>0.05
Rs. 10001-15000	82	33	15	33	1				
Rs. 15001-20000	18	12	4	2	0				
R20001 and above	5	3	1	1	0				
Type of family									
Joint	110	41	21	44	4	8.85	6	12.59	0.18, NS, p>0.05
Nuclear	102	48	17	33	4				
Extended	8	7	0	1	0				
Type of diet									
Vegetarian	77	28	10	34	5	8.27	4	9.48	0.082, NS, p>0.05
Non Vegetarian	0	0	0	0	0				
Mixed	143	68	28	44	3				

A similar study was conducted in the year of 2003. This cross sectional study was conducted in Nagpur among adolescent females in the urban area. A total 296 adolescent females, age of 10-19 year were participated in the research. In result prevalence of anemia found

35.1% and a found a significant association of anemia with the literacy of parents.11 Association of perceived causes of nutritional anemia among adolescent girls in relation to type of diet Present study show the association between the perceived causes of nutritional anemia

of adolescent girls with type of diet were significant i.e. $p = 0.034$. Hence it is interpreted that there was significant association with type of diet which explains

the adolescent girls having a good knowledge those are taking mix diet (Milman 2011).

Table 3 n=124

Demographic variables	No. of adolescent girls	Mean Score $\pm$ SD	F-value	df	F- tab value	p-value
Age (yrs)						
10 yrs	22	3 $\pm$ 1.02	0.94	5,118	2.29	0.45, NS, p>0.05
11 yrs	14	2.64 $\pm$ 0.84				
12 yrs	21	2.85 $\pm$ 0.96				
13 yrs	15	2.66 $\pm$ 1.04				
14 yrs	19	3.10 $\pm$ 0.99				
15 yrs	33	3.12 $\pm$ 0.81				
Education of adolescent girls						
4-5 th std	36	2.86 $\pm$ 0.96	0.84	3,120	2.68	0.47 NS, p>0.05
6-7 th std	34	2.79 $\pm$ 1.00				
8-9 th std	50	3.10 $\pm$ 0.88				
10 th std	4	3.00 $\pm$ 0.81				
Education of caretaker						
Illiterate	1	3 $\pm$ 0	0.77	6,117	2.18	0.59, NS, p>0.05
Primary	16	3.06 $\pm$ 0.77				
Secondary	25	3.04 $\pm$ 1.09				
SSC	38	2.73 $\pm$ 0.86				
HSC	28	2.67 $\pm$ 1.02				
Undergraduate	11	3.18 $\pm$ 0.75				
Graduate and above	5	3 $\pm$ 1.22				
Monthly income(Rs)						
5001-10000 Rs	68	2.95 $\pm$ 0.95	1.92	3,120	2.68	0.13, NS, p>0.05
10001-15000 Rs	47	2.85 $\pm$ 0.85				
15001-20000 Rs	7	2.14 $\pm$ 1.21				
20001 Rs and above	2	3.50 $\pm$ 0.70				
Type of family						
Joint	70	2.87 $\pm$ 0.99	0.01	2,121	3.07	0.98, NS, p>0.05
Nuclear	53	2.88 $\pm$ 0.89				
Extended	1	3 $\pm$ 0				
Type of diet						
Vegetarian	48	3.10 $\pm$ 0.88	2.14	122	1.98	0.034, NS, p>0.05
Non Vegetarian	0	-				
Mixed	76	2.73 $\pm$ 0.95				

A cross sectional study was conducted to find prevalence of anemia and various factors influencing anemia among adolescent girls in urban and rural field practice areas of Osmania Medical College. In present study those who were taking meat more than once a week had less percentage of anemia 38 (36.9). Those respondents who never took green leafy vegetables have more prevalence of anemia in both areas.¹²

CONCLUSION

There is found a significant association between prevalence of nutritional anemia among adolescent girls with education of caretaker and perceived causes of nutritional anemia among adolescent girls with the type of diet.

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