



Prevalence of Nutritional Anemia and Its Causes among Adolescent Girls

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i46B32965

Editor(s):

(1) Dr. Vasudevan Mani, Qassim University, Saudi Arabia.

Reviewers:

(1) C. Mohan Rao, KIIT University, India.

(2) Nikhil Sunil Nasikkar, MUHS, India.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/74281>

Study Protocol

Received 15 July 2021

Accepted 23 September 2021

Published 23 October 2021

ABSTRACT

Background: 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. In this condition hemoglobin content in the blood is lower than usual. Nutritional anemia has been described as correlated with reduced childhood emotional, physical, and cognitive function and is a major risk factor for maternal mortality.

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

Methodology: This is a cross sectional observational study will be conducted among the adolescent girls where age is between 10-14 years, the sample size can be calculated statistically by using the prevalence of previous studies which done in India and the sample size is 220 adolescent girls selected in a particular rural community area of Wardha district. Non-probability convenience sampling will be using for sample collection. The standard haemoglobinometer (Accusure HB meter) for analyzing the haemoglobin according to WHO criteria and structure questionnaire scale is made upon the causes behind the nutritional anemia. According to some previous studies, the prevalence rate has been shown high in the adolescent age group so this

study help to find the prevalence rate in a particular community and the causes of nutritional anemia among adolescent girls.

Expected Results: In this study the researcher evaluate the prevalence and its causes of nutritional anemia among adolescent girls, this study will show the rate of prevalence in the particular community area and also the causes of nutritional anemia among adolescent girls.

Conclusion: The conclusion will be drawn from the results.

Keywords: Prevalence; causes; nutritional anemia; adolescent girls.

1. INTRODUCTION

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, in this condition the haemoglobin content in the blood is lower than usual [1].

Nutritional anemia has been described as correlated with reduced childhood emotional, physical, and cognitive function and is a major causative factor for the maternal death rate in females [1]. The word anemia is derived from a Greek word which means "without blood." Symptoms of anemia were first recognized by the word 'chlorosis', in a Greek term. Anemia is a condition in which the red blood cells doesn't work properly that results from a low average level of haemoglobin. The previous reference to anemia can be traced back to 1684 when Robert Boyle performed a study on composite blood [2].

The age group between 10-19 years, according to the WHO adolescent age group [3]. Speedy physical, psychological, and cognitive growth characterizes this time. In the human lifespan, this is a fragile stage in the development of anemia. Adolescents are almost one tenth of the Indian population and constitute a vital sector of the population. The well-being of the present as well as future generations will be determined by their current nutrient intake. Since teenage age in the early years of growth, anemia has some long-term effects at this stage of life, such as inhibited growth, poor school results, decreased immunity, irregular menstrual cycles, later poor pregnancy outcomes such as intrauterine growth restriction, premature birth, elevated perinatal morbidity, and mortality. The most common nutritional condition globally is anemia. Because of the requirements for accelerated growth and menstrual blood loss, anemia is normal in teenage girls. WHO shows that the anemia prevalence in adolescent girls in developing countries like India about 27% and developed countries near by 6% [4].

Anemia affects one majority of the population's, mainly iron deficiency anemia. India continues to be one of the highest rates of anemia in the world. According to the National Family Health Survey (NFHS-3), anemia affects 70-80 percent of adolescents, 70 percent of pregnant women, and 24 percent of adult males. Low nutritional intake, insufficient iron access, severe menstrual blood loss, recurrent internal bleeding due to infection of hookworms, and malaria this are the causes behind the high prevalence of anemia in India. Although anemia had well-known negative effects on individuals' functional and mental abilities, the real cost of iron deficit anemia lies in the negative effects on maternal and fetus health. In pregnancy, low nutritional condition and anemia have effects that span over decades [5].

Around 30 percent of the population of a world was anaemic in 1985, stated by the World Health Organization (WHO) [6]. In 1992, 37 percent of all women were estimated to be anemic by the WHO [7]. In a 2008 WHO research, 24.8 percent of the world's population was affected by anemia, including 42 percent of pregnant women, 30 percent of non-pregnant women, and 47 percent of pre-school children [8]. The prevalence of worldwide anaemia has most commonly been estimated at 29 percent in pregnant women, In non-pregnant women, 38 percent and 43 percent in infants, with declines in each group since 1995 [9].

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 to 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 [10].

1.1 Objective

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

2. METHODOLOGY

This is a cross sectional observational study will be conducted among the adolescent girls where age is between 10-14 years, the sample size can be calculated statistically by using the prevalence of previous studies which done in India and the sample size is 220 adolescent girls selected in a particular rural community area of Wardha district. Non-probability convenience sampling will be using for sample collection and data will be collected by travel method like walking and sitting with family. The standard haemoglobinometer (Accusure HB meter) for analyzing the haemoglobin according to WHO criteria and structure questionnaire scale is made upon the causes behind the nutritional anemia. According to some previous studies, the prevalence rate has been shown high in the adolescent age group so this study help to find the prevalence rate in a particular community and the causes of nutritional anemia among adolescent girls.

2.1 Inclusion Criteria

1. Adolescence girls who are willing to participate in the study.

2. Adolescence girls are aged between 10-15 years.

2.2 Exclusion Criteria

1. Adolescence girls who are already taking treatment for anemia.
2. Adolescence girls who are having a blood-related disorder.

2.3 Withdrawal Criteria

Study participants those fulfill the below criteria will be withdrawn in the study:

- Want to withdraw from the study
- Incidence of a serious illness
- Not fulfilling study schedule
- Those are in menstrual phase

2.4 Sample Size

The sample size was the total number of subjects participating in the study.

In this study sample size was 220 adolescent girls.

Sample size formula with desired error of margin

$$n = \frac{2\alpha^2/2 \cdot P \cdot (1-P)}{d^2}$$

Where,

$2\alpha/2$ is the level of significance at 5% i.e. 95% confidence interval = 1.96

P = prevalence of anemia in girls from rural area = 28.6%=0.286

$$n = \frac{1.96^2 \times 0.286 \times (1-0.286)}{0.06^2}$$

$$= 217.90$$

$$= 220 \text{ samples needed in the study [4]}$$

2.5 Outcome Measures

The primary outcome is find out how common nutritional anemia in teenage females and to find causes which can be contributed to the high prevalence of anemia.

The secondary outcome is providing awareness among the community people regarding how to significant causes can be raising the prevalence among adolescent girls.

2.6 Data Management and Prevalence Assessed

The demographic data (age in year, education, education of caretakers, types of family, monthly income, type of diet) which is included in the study to know the sociodemographic information about the study participants. Firstly, permission will be taken from the sarpanch in the selected rural community area and before conducting the data collection the consent will be taken from study participants and establish a good interpersonal relationship. After that hemoglobin can check by using a portable haemoglobinometer and categorized according to WHO criteria and a structured questionnaire will use as a tool for causes of nutritional anemia in anemic teenage girls to know the causes behind the nutritional anemia.

2.7 Statistical Analysis

By using SPSS software version 22 the statistical analysis can be done. For analyzing the data unpaired t-test (Wilcoxon Rank-sum) and Paired t-test (Wilcoxon sign rank) can be applied.

3. EXPECTED OUTCOMES / RESULTS

In this study the researcher evaluate the prevalence and the perceived causes of nutritional anemia among adolescent girls, this study will show the rate of prevalence in the particular community area and also the perception of causes regarding the nutritional anemia among adolescent girls.

4. DISCUSSION

A study will be conducted to find the prevalence rate and causes of nutritional anemia. This is a cross sectional observational study will be conducted among the adolescent girls which having age 10-14 years, the sample size can be calculated statistically by using the prevalence of previous studies and the sample size is 220 adolescent girls selected in a particular rural community area of Wardha district, the sample collection done by using non-probability convenience sampling. The standard haemoglobin meter (Accusure HB meter) for analyzing the haemoglobin and structure questionnaire scale is made based on the causes behind the nutritional anemia. According to some previous studies, the prevalence rate has been shown high in the adolescent age group so this study help to find the prevalence rate in a particular community is and the causes of nutritional anemia.

Table 1. Structure interview questionnaire on causes of nutritional anemia

Structure questionnaire on perceived cause of nutritional anemia	Yes	No
1. Do you have any genetic history of any type of anemia.		
2. Do you have a history of a heavy menstrual period.		
3. Do you suffering from any chronic disease in past for 3 months or more. If yes – (name of disease condition)		
4. Do you think that you have taken an inadequate intake of iron in food.		
5. Can hookworm infestation causing anemia.		
6. Can drink coffee or tea will decrease iron absorption if taken during the main meal.		
7. Do you take a diet low in fruits, vegetables, and cereals.		
8. Do you eat overcooked food.		
9. Do you take any type of medicine. If yes—(name of medicine)		
10. Do you eat junk food.		

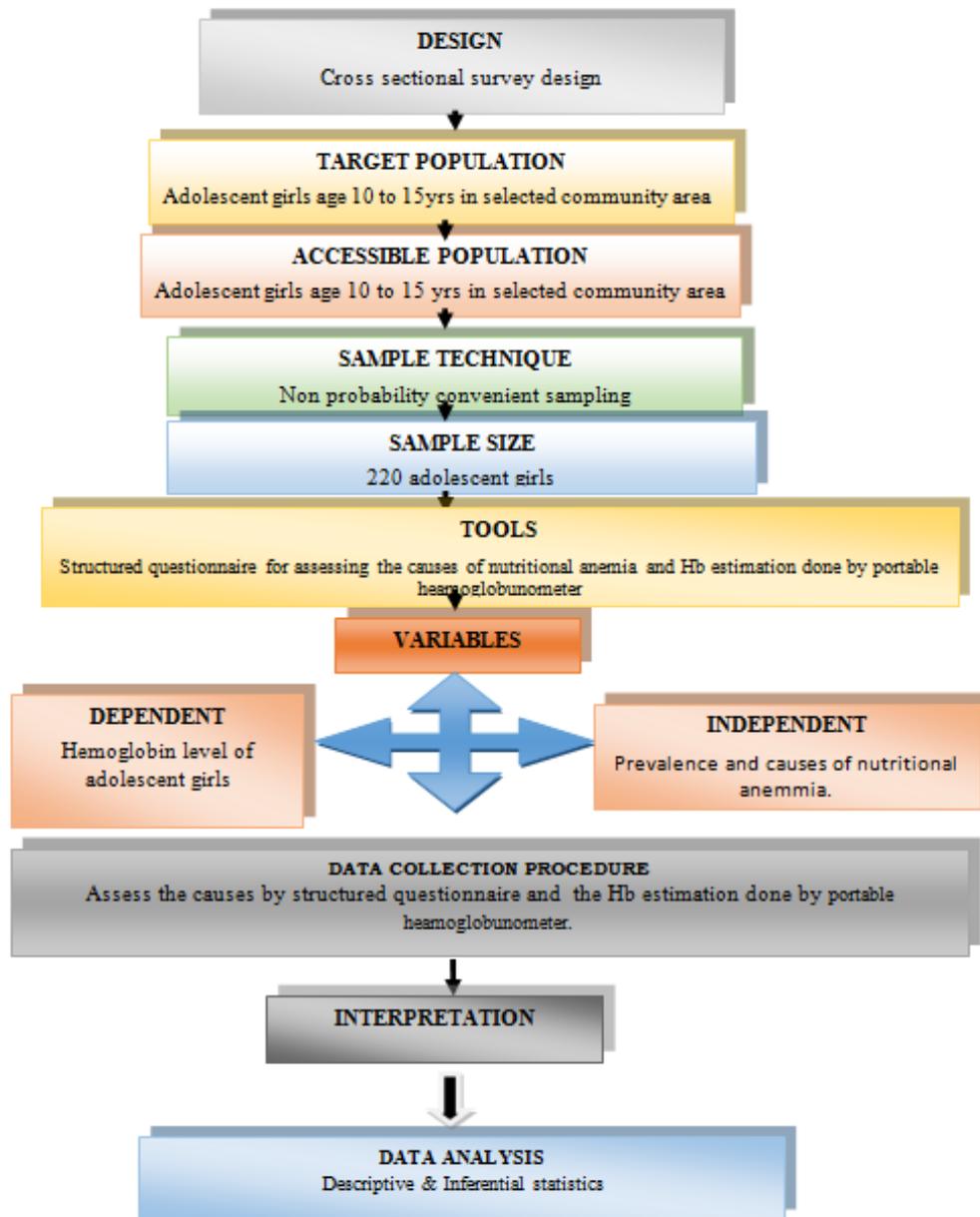


Fig. 1. Schematic presentation of descriptive research design used for the present study

5. CONCLUSION

The statistical analysis can show the conclusion.

ETHICAL APPROVAL AND CONSENT

The Ethical Committee of DMIMS (DMIMS (DU/IEC/Aug-2019/8685) can kindly approve the research study, consent can be sign by all the researcher participants. The study result can be published in a peer-reviewed publication and disseminated the study result.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle4.com/review-history/74281>