



## PREVELANCE OF ANEMIA AMONG THE SCHOOL GOING ADOLESCENT GIRLS OF RURAL AREA IN RAIGAD DISTRICT, MAHARASHTRA

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### ABSTRACT

**Background:** Anemia may strike people of any age or in any part of the world, making it a substantial risk to the health of the general population. By a wide margin, the most common kind of anaemia is nutritional anaemia, which may be brought on by a deficiency in either iron, folate, or vitamin B12. Due to the fact that its symptoms are rather modest, iron deficiency anaemia (IDA) often stays undetected or untreated for an extended period of time.

**Aim and Objectives:** The critical aim and objectives of the study is to understand the prevalence of anaemia among the school going children in rural areas of Maharashtra , also analyse the major causes of anaemia among school going children's and apprehend the steps to be taken to overcome the issues related to anaemia among the children's.

**Methods and Materials:** The study is conducted at rural area of Maharashtra, India, the study was conducted for a period of 3 months, a total of 155 students were selected based on convenience sampling, the data were collected through closed ended questionnaire and results were analysed using SPSS version 18.

**Results:** The analysis reveals that girl children who does not possess proper diet suffer from anaemia, also it is noted that that the major causes for anaemia is lack of iron rich foods and other related factors. The results shows that nearly 76.13% of the children were diagnosed with anaemia and also 69 of the respondents mentioned that deficiency of iron is the major causes for anaemia. The prevalence of anaemia has significantly decreased because to advancements in dietary practises, educational opportunities, and preventive medical treatment ( $P > 0.05$ ).

**Conclusion:** The study reveals that the anaemia is considered to be critical aspect for many health related problems among school children, hence proper diet, frequent medical checkups need to be undertaken in order to overcome the deficiencies and create better society for the future.

**Keywords:** Anaemia, Iron deficiency, School children, Chi square test

### INTRODUCTION

Anemia is a major cause for worry when it comes to global health since it is an illness that may strike anyone of any age and can occur anywhere in the world. Nutritional anaemia is the kind of anaemia that affects the most people. It's possible that not getting enough iron, folate, or vitamin B12 had a role in its development. Despite the fact that iron deficiency anaemia (IDA) is a major health issue, the condition is usually misdiagnosed or ignored until it has progressed to a severe state. A person is said to be in their adolescent years if they are between the ages of 10 and 19, according to the World Health Organization (WHO). Some of the long-term implications of teenage anaemia include problems with growth and learning, a lowered immune system, irregular periods, and unfavourable pregnancy outcomes (Elmardi 2020). Conditions such as rheumatoid arthritis, congestive heart failure, essential hypertension, hypothyroidism, and coronary artery disease have all been linked to an increased risk of developing anaemia. However, if the anaemia is detected and treated in its early stages, many of the symptoms may be averted altogether. In most cases, moderate to severe anaemia occurs in adolescence.



Anaemia affects around 27 percent of teenage girls living in countries with low incomes, whereas it affects just 6 percent of their counterparts living in areas with high incomes, according to research estimates. According to the National Family Health Survey, anaemia affects around 53 percent of Indian women between the ages of 15 and 49. (NFHS-4) The incidence of anaemia is highest in rural Maharashtra, despite the fact that its prevalence varies throughout the nation. This demonstrates how important it is to have a solid grasp of the elements that lead to anaemia in more distant areas. It would be beneficial for teenage girls to be informed of the signs of anaemia so that they can take better care of themselves as they obtain more independence and responsibility. Having this knowledge would allow them to better manage their health (Bathla 2021). If we had access to this information, we could devise an all-encompassing plan for the treatment and prevention of anaemia in teenage girls who exhibited these traits (Bellizzi, 2021). This study's objective was to determine the prevalence of anaemia in the school-aged female population in rural Maharashtra as well as the risk factors related with the condition.

Girls throughout their teenage years are especially susceptible to the negative effects that poor nutrition may have on their health, including anaemia brought on by a deficiency in iron and an insufficient amount of calories consumed (Ramzi, 2011). The majority of people who have anaemia are unaware that they have the ailment, making them comparable to the piece of an iceberg that is below the surface. The pandemic of anaemia starts in pregnant women who are already anaemic and spreads through their children and their children's children, in part because of a deficiency of iron in the diet (Kapil, 2014). People who live in the suburbs or the country don't appear to have as much of a problem with this matter as city dwellers do. The start of menstruation, leading a sedentary lifestyle, eating a bad diet, having an uneducated parent, living in poverty, having dogmatic cultural beliefs around food, and religious dogmatism are all possible causes (Kotecha, 2009). Anemia is a common health concern, but only a small percentage of people understand what causes it and why it's important to consume foods and supplements that are high in iron. As a direct consequence of this, anaemia has developed into a major problem in terms of worldwide health. The following study's objective was to establish the percentage of young women in rural Maharashtra who meet the aforementioned requirements and are currently enrolled in formal education programmes who are affected by anaemia (Sarna 2020).

### **AIM**

The critical aim and objectives of the study is:

To understand the prevalence of anaemia among the school going children in rural areas of Maharashtra

To analyse the major causes of anaemia among school going children's

To apprehend the steps to be taken to overcome the issues related to anaemia among the children's

### **LITERATURE REVIEW**

According to the findings of the NFHS-4, the prevalence rates of anaemia varied from 30 to 69% across all age groups. The major goal of the POSHAN Abhiyan, which was initiated in March of 2018, is to lower the number of people who are affected by anaemia. For the purpose of assisting the POSHAN Abhiyan and the National Nutrition Approach in achieving their respective goals, the NITI Aayog developed a system that they call the Anaemia-Free India (AMB) technique. Because to the efforts of the Anaemia Mukta Bharat campaign, the prevalence of anaemia in India is expected to drop by three percentage points per year between the years 2018 and 2022. The POSHAN Abhiyan will be able to meet the needs of each Indian community, regardless of its size, from the tiniest village to the most populous metropolis. 2019 (Fernandez-Gaxiola). As part of the celebrations for Nutrition Month in September 2019, the Indian Ministry of Health and Family Welfare has issued a directive requiring all state and district health



authorities in the country to hold Test, Treat, and Talk (T-3) Anaemia camps at all schools, universities, and other institutions that are run by the government (Poshan Maah). The goal was to reduce the alarmingly high rate of anaemia that was seen in that particular location. The disturbingly high rate of anaemia that exists in India was the primary focus of this initiative. If the Anaemia Mukht Bharat plan is implemented in rural areas with the help of T-3 anaemia camps, primary care doctors, and other frontline health professionals, there is a possibility that the incidence of anaemia among adolescents may decrease (Sedlander, 2020).

Anemia in teenagers has been related to detrimental impacts on the health, productivity, and academic achievement of those affected by it. To put it more simply, our health as well as the health of future generations will benefit from this (Rawat, 2016). Anemia is not considered to be a significant threat to public health, according to the World Health Organization. Additionally, a slight degree of anaemia was revealed by the haemoglobin level (Sharma, 2015). The duration of the menstrual cycle, the body mass index, the number of Red blood cells, the haemoglobin concentration, the mean corpuscular volume, and the mean corpuscular haemoglobin concentration were significantly different between individuals who were anaemic and individuals who were not anaemic. At the 0.05 level of significance, these findings were deemed to be significant. Beginning in the year 2020 (Sharma). A combination of bivariate analysis and logistic regression was used to identify the factors that are most strongly linked with anaemia. In the bivariate analysis, variables such as the length of the menstrual cycle, the body mass index, the height, the amount of iron consumed, the white blood cell count, the haemoglobin concentration, the hematocrit, the mean corpuscular volume, the mean corpuscular haemoglobin concentration, and the hematocrit were all considered (MCHC). The Red blood cell count, the haemoglobin concentration, the transferrin saturation, the mean corpuscular volume, the mean corpuscular haemoglobin concentration, and the mean corpuscular hematocrit concentration were not included in the analysis because low levels of these blood components could be a sign of low haemoglobin concentrations. According to the findings of a logistic regression study, the two factors that were most important in determining whether or not a person had anaemia were the average length of menstrual cycles and the mean ultra-fine iron concentration of their blood (Bodati, 2020). In spite of the fact that anaemia is a sign of a nutritional shortage, there is no discernible difference between the nutrient intake of those with anaemia and those who do not have the condition. The teenagers who had anaemia tended to consume more food on a daily basis than their classmates. The results of the research provide credence to the widespread notion that teenagers often consume food in between meals. In the year 2018, a significant number of pupils in elementary, middle, and high schools eat meals and drinks that are not good for them, such as those that are high in fat and sugar content. This finding lends credence to the idea that teenagers have a predilection for sugary foods and processed carbohydrates. The majority of individuals are of the opinion that eating a diet that is mostly comprised of processed meals and other types of junk food should be avoided at all costs. Teenagers' nutritional consumption varies greatly. While the recommended daily allowance (RDA) is readily exceeded by a few foods, others fall short. Because of this, some adolescents end up being underweight, while others end up becoming overweight. This is leading in twice as many incidences of disease, according to the World Health Organization (WHO) (Kamble, 2021). In spite of efforts made to assist these young people, India continues to struggle with issues related to famine and poverty (obesity and malnutrition). There are about equal numbers of children without parents living in India (25.5 million), Nigeria (3.4 million), and Indonesia (25.9 million) (3.3 million). Overweight is defined as having a body mass index (BMI) of 25 or more, which is the case for millions of young individuals in the countries of China, Indonesia, India, Egypt, Brazil, and Pakistan. Pakistan, Brazil, and the United States are three of the nations that have the highest rates of childhood obesity. Iron-deficiency



Even while inadequate nutrition is the most prevalent cause of anaemia, consuming an excessive amount of food may also contribute to this disease. [Cause and effect] The most common cause of anaemia caused by a lack of iron in the diet is insufficient food consumption. Inadequate consumption of certain minerals may also lead to anaemia. [Cause and effect] Access to health education for women that places a focus on the relevance of eating a healthy, balanced diet is necessary in order to reduce the number of women who suffer from anaemia (Dhillon, 2021).

A deficiency of haemoglobin may lead to the disease known as anaemia, in which the body does not get the necessary amount of oxygen. There is a potential for several negative effects on one's health as a result of this. What we put into our bodies has the potential to have an effect on the amount of pleasure that we feel. A more in-depth analysis lends credence to what has been hypothesised for some time now, namely, that anaemia in adolescents is linked to a worse quality of life. According to the World Health Organization, the total of a person's goals, ambitions, wants, and concerns, as well as their sense of purpose in everyday life and the way they perceive themselves fitting in with their culture and beliefs, is what determines that person's quality of life. This holds true for them in light of the beliefs and rituals they see in the here and now (QoL). Reducing the prevalence of anaemia among women of reproductive age may lead to improvements in maternal and child health, educational attainment, labour output, birth outcomes, and long-term economic and social progress. These improvements may be achieved by reducing the number of women who are anaemic.

### RESEARCH METHODS

All of the respondents were chosen from different secondary schools using a random selection process. In order to narrow the focus of this investigation, only schools that cater to women were taken into consideration. All females between the ages of 10 and 19 who gave their consent to have their haemoglobin levels checked were included in the study. Data was collected using interviews that made use of a questionnaire that had been pre-tested, and the programme HemoCue was used to compute the levels of haemoglobin (Hb 201). (Hb 201). The sensitivity of the HemoCue system ranges from 75% to 91%, and its specificity goes from 88% to 100%. The diagnostic criteria for anaemia established by the World Health Organization were used in order to determine each person's overall degree of anaemia. The prevalence of anaemia was estimated by the use of haemoglobin levels as a proxy. A semi structured questionnaire was used to gather data on the participants' socioeconomic position, menstrual cycle, dietary habits, and level of acquaintance with the prevalence, causes, symptoms, and treatment of anaemia. The precise weight was found out by using a manual scale that was compact and portable.

### FINDINGS

This analysis states the critical understanding of the demographic variables of the respondents and the reasons for anaemia among the school children, moreover, chi square test is applied to overcome anaemia.

**Table 1: Age of the respondents**

Children age composition	Frequency	Percent
10 – 13	21	13.55
13 – 16	71	45.81
16 – 19	63	40.65
Total	155	100.00

From the analysis it is noted that 13.55% of the respondents were in the age group between 10 – 13 years, 45.81 % were in the age group between 13 – 16 years and 40.65% were in the age group between 16 – 19 years.

**Table 2: Children diagnosed with Anaemia**

Children diagnosed with Anaemia	Frequency	Percent
Yes	118	76.13
No	37	23.87
Total	155	100.00

From the analysis it is noted that 76.13% of the respondents were diagnosed with anaemia, this has been gathered based on the recent health check-up understand by the respondents, and remaining 23.87% were not diagnosed with anaemia

**Table 3: Major causes of Anaemia**

Major causes of Anaemia	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Deficiency of Iron	10	11	23	42	69
No proper diet	12	9	23	72	39
Infection	18	3	23	69	42
Other reasons	13	21	5	54	62

Based on table 3, the analysis shows that 69 respondents have strongly agreed that deficiency of iron is the main cause of anaemia and 42 of the respondents have agreed to the statement, however 39 of the respondents mentioned that no proper diet is the major reason contributing to anaemia and 72 of the respondents have agreed to the same, whereas infection and medical issues are also major causes of anaemia, this statement was strongly agreed by 42 respondents and 69 respondents have agreed to the same. Lastly, 62 respondents have strongly agreed that there are other reasons like haemoglobin issues and related reasons, 54 of the respondents have agreed to the same.

#### Chi square test

The last step is to perform the chi square analysis to understand the nature of association between the methods to overcome anaemia among the children

**Table 4: Chi square analysis between proper diet and overcoming anaemia.**

Proper Diet	Value	P
Pearson Chi-Square	214.519a	0.00
Likelihood Ratio	168.629	0.00

Based on the analysis it is noted that the significance value is 0.00, hence it can be concluded that there is a significant association between taking proper diet and overcoming anaemia among school children.

**Table 5: Chi square analysis between better awareness among children and overcoming anaemia.**

Better Awareness	Value	P
Pearson Chi-Square	220.682a	0.00
Likelihood Ratio	164.866	0.00



Based on the analysis it is noted that the significance value is 0.00, hence it can be concluded that there is a significant association between creating better awareness among children and overcoming anaemia among school children.

**Table 6: Chi square analysis between Regular medical check-up and overcoming anaemia.**

Regular medical check-up	Value	P
Pearson Chi-Square	172.224a	0.00
Likelihood Ratio	133.639	0.00

Based on the analysis it is noted that the significance value is 0.00, hence it can be concluded that there is a significant association between getting regular medical check-up and overcoming anaemia among school children.

## DISCUSSION

More than half of the people who participated in our survey shown an insufficient understanding of the factors that cause the condition, the symptoms that it produces, the treatments that are available, and the foods that are high in iron. This trend was also shown by earlier study. Researchers showed that female high school students in metropolitan areas had a better awareness of anaemia and the factors that contribute to its development than their male counterparts did. In rural Maharashtra, there may be a lack of awareness with national health efforts as well as basic health and hygiene practises. This may be the cause of the problem. In addition, a number of studies with community adolescents and adolescents who did not attend school found that these groups had a limited understanding of anaemia and the factors that contribute to it. The outcomes of this research not only confirmed the need of providing comprehensive anaemia education for teenagers, but they also brought to light the scarcity of educational resources that are presently accessible in educational institutions as well as in families. Despite the prevalence of anaemia among teenagers and the fact that its symptoms are not particularly distinct, the condition is often misdiagnosed due to a lack of screening.

When administered on a daily basis as compared to a less frequent schedule, children who received supplements had a lower chance of developing anaemia. However, research suggests that in locations and situations where regular supplementation is not feasible, intermittent supplementation may be used as a public health intervention to reduce the prevalence of paediatric anaemia. Anemia was not improved by deworming, treating *H. pylori*, or implementing water, sanitation, and hygiene (WASH) initiatives, since this was not shown to be the case. The World Health Organization (WHO) defines adolescence as the period of time that occurs between the ages of 10 and 19 years old. The effects of anaemia, which might include delayed development, reduced cognitive function, weakened immunity, irregular menstrual cycles, and therefore poor pregnancy outcomes, can endure a lifetime since this age is a critical developmental year. An increased likelihood of developing anaemia has been connected to a number of different disorders, including rheumatoid arthritis, congestive heart failure, essential hypertension, and hypothyroidism, amongst others. It is common for adolescents to suffer the initial signs of moderate to severe anaemia, and if the illness is detected and treated in its early stages, it is possible to prevent the bulk of the consequences that are connected with this condition.

It is possible to lower the prevalence of anaemia in teenage girls by providing them with enough iron and folic acid supplements, iron-rich diets, great nutrition education, and regular deworming. A significant amount of stress should be put on the need of holding regular health check-up camps in schools, so that any potential health problems may be detected and addressed as soon as possible. It is impossible to



overestimate how important it is for a school catering to females to have a female counsellor on staff. She should be available to provide consistent advice to pupils on how to cope with the specific issues that they face and reduce unneeded stress. Anemia in teenage females should be carefully assessed by a primary care physician in any place where they emerge, and if anaemia is clinically evident, a comprehensive hemogram should be considered. Our findings regarding the high prevalence of anaemia in adolescent girls, as well as their awareness of it and related factors, should be replicated by others and used by primary care physicians for the early detection and prompt management of anaemia, along with appropriate counselling of girls, their families, and schools. In addition to this, appropriate counselling should be provided to girls, their families, and schools.

### CONCLUSION

The latest research discovered that a significant proportion of people suffer from anaemia. Second, there is always potential for improvement in the manner that information is acquired on the health of women and girls, especially in rural areas of India. This is an issue that is particularly prevalent in rural areas of India. It is necessary to take preventative measures in order to lower the rate of anaemia that is seen in teenage females. These measures include educating the girls and providing them with additional school nutrition at free or very little expense. According to the findings of this study, anaemia is more prevalent among girls of school-age in the Indian state of Maharashtra. A lack of proper diet, a resistance to deworming medication, being overweight, and having pale skin have all been associated to anaemia in young women. In addition to the conventional T-3 camps that are offered in all schools, there is an urgent need to evaluate the many school-based iron and folic acid supplementation programmes for teenagers. These programmes should be considered in conjunction with the usual T-3 camps. The initiative known as Anaemia Mukh Bharat (Anaemia Free India) is now putting into effect a comprehensive set of rules and procedures that, if successful, will make it possible to reduce the prevalence of anaemia among adolescents.

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