

**Knowledge regarding anaemia and its impact on adolescent girls of the Kolam tribe; A cross-sectional study**

## Abstract

**Background:** Anaemia is a significant global health concern. Mostly adolescent age group are more prone to anaemia. Whereas tribal groups are more susceptible to anaemia because of lack of awareness, lack of hygiene etc. Tribals are considered backward, primitive groups who are hesitant to seek out the community's health services. Thus, it is necessary to investigate their current state of health. **Objective:** the present study was to know the socio-demographic profile and, Secondly, to find out the knowledge regarding anaemia and lastly, to assess the anaemic status in adolescent girls. **Methods:** it is a cross-sectional study conducted in a Government Higher Secondary school with purposively selected 60 study subjects aged 17&18 years, using a predesigned and pre-tested questionnaire the study was conducted from October 2023 to February 2024. The tools used were a stadiometer, and digital weighing machine for anthropometric assessment and anaemic status was assessed using a hemoglobinometer. **Results:** A mean age of  $17.23 \pm 0.419$  years was observed. in which 75% were anaemic i.e. n=60 and only all the study subjects belonged to the Kolam tribe. And only 20% of them are aware that haemoglobin status can assess iron deficiency. Last, but not least only two-fourth of them were aware of anaemia. **conclusion:** The study reveals the prevalence of anaemia is about 75% and they are not much aware of anaemia and its associated factors.

**Keywords:** Kolam tribe, anaemia, adolescent girls, healthier life, PVTG.

## Introduction

WHO, stated that anaemia affects 30% of women aged 15 to 49 years. (World Health Organization: WHO; World Health Organization: WHO, 2023a). It is a serious public health issue, affecting 1.9 billion people worldwide in 2017. (World Health Organization: WHO & WHO, 2023b).

Anaemia prevalence in adolescents, particularly girls, is a significant public health concern, varying by geography and ranging from 19% to 85.9%. (Kounnavong *et al.*, 2020; Chand *et al.*, 2016). Anaemia in adolescents is predicted by many factors, including poorer educational attainment, living in a rural area, late adolescence, lack of exposure to mass media, stunting, and food insecurity. (Gebreyesus *et al.*, 2019) Iron deficiency anaemia in adolescents is linked to various risk factors including insufficient dietary habits, menstruation, low education, poor understanding of anaemia, and parasitic infection (Wiafe *et al.*, 2023). Adolescent girls' anaemia prevalence is greatly influenced by sociodemographic variables such as financial status, caste/ethnicity groups, and environmental zones. (Rai *et al.*, 2023)

Kolam tribe specifically, factors such as the community of residence and the father's educational level are highlighted as sociodemographic determinants influencing anaemia prevalence among adolescent girls of this tribe. (Wemakor *et al.*, 2023). The Kolam tribe's wealth quintiles show significant differences in anaemia prevalence, with lower wealth quintiles having lower anaemia rates. (Rai *et al.*, 2023) They live in exclusive settlements in forests and mountainous tracts, their population, according to the 2011 Census, is 44,805. The traditional diet consisted of coarse millets like sorghum, pearl millet, barnyard millet, finger millet, foxtail millet, grains like dryland rice, lentils, and wild forest food harvested during monsoon. (Kukreti *et al.*, 2016)

Specifically, the educational levels of parents have a significant impact on the nutritional status of adolescents, with maternal education inversely associated with the risk of anaemia among adolescents. (Wemakor *et al.*, 2023) Furthermore, the educational background of fathers also

emerges as a crucial factor, as adolescents with fathers lacking formal education face a higher risk of anaemia compared to those with educated fathers

This research paper reveals the impact of sociodemographic factors on anaemia prevalence among adolescent girls in the Kolam tribe. Wealth quintiles, caste/ethnicity groups, and ecological zones influence anaemia prevalence. Lower wealth quintiles have lower anaemia prevalence. Community of residence and parental education level also influence anaemia prevalence. Promoting iron and vitamin C-rich diets and educational programs is crucial for preventing anaemia. The study suggests targeted interventions and community-based programs to combat anaemia effectively.

## Materials and methods

The present study was conducted at the higher secondary schools in the district of Komuram Bheem Asifabad in Telangana state from December 2023 to January 2024. The study's subjects included adolescent girls in government college aged between the ages of 17 and 18. A random number system was used to choose research participants at random from a list of teenage females who attended all of the upper secondary schools in the catchment region.

According to the NFHS-5 fact sheet, Telangana prevalence of anaemia among adolescent girls in Asifabad district was 74.5%, with a 95% confidence limit and allowable error of 15%, the sample size of 60 was calculated using the formula:

$$n = \frac{4pq}{(e)^2}$$

where, N= sample size, P =prevalence of anaemic status, e = permissible level of error. Whereas the prevalence of anaemia in adolescent girls as per NFHS-5 i.e.P=74.5% and q is taken as (1-p) i.e. q =25.5 and the permissible level of error is taken 15% i.e e= 11.25 and the confidence level taken was 99%, 57 sample size was obtained out of which 60 sample size was taken.

Here a total of 60 adolescents were included in the study. All the randomly selected study subjects who were willing to participate were included in the study. The study included every willing subject chosen from random among the research subjects. Before beginning the study, all participants provided informed written consent (informed child assent in the case of children aged 17-18). Participants who refused to participate, give consent, or provide a blood sample to assess haemoglobin levels were excluded from the study. Before beginning the study, written consent was collected and a formal letter was collected from each randomly chosen participant in the catchment region.

All the study subjects were interviewed using a pre-formed and pretested, semi-structured questionnaire. It included questions on basic demographic details including family composition, socioeconomic status, anthropometric assessment, clinical methods to assess anaemia and self-assessment, dietary assessment and knowledge of various aspects of anaemia.

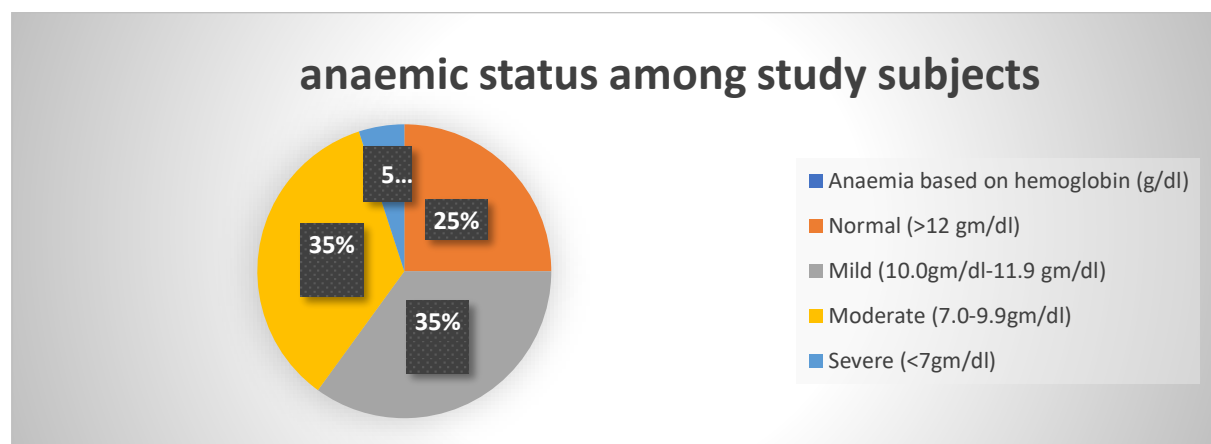
Haemoglobin was measured using a hemoglobinometer with all the aseptic precautions while collecting samples for haemoglobin assessment. According to WHO (2023a,b), anaemia among adolescent girls is classified into three degrees: 11.0-11.9 mg/dl is mild, 8.0-10.9 mg/dl is moderate, and <8.0 mg/dl is severe.

Modified kuppuswamy classification for socioeconomic status was used.

Data collection processing was done using SPSS Windows software version 20. Descriptive statistics using proportions were used for sociodemographic variables. cross tabulation using Pearson's chi-square test was conducted to establish an association between anaemia and knowledge of signs and symptoms of anaemia as dependent variables and various determinants as independent variables.

## Results

The anaemia prevalence among adolescent girls in the present study was 75%. In the study, of 60, 35% (21) were mildly anaemic, whereas 35%(21) were moderately anaemic and 5%(3) were severely anaemic. Only 25%(15) of the population had normal haemoglobin levels i.e.12mg/dl and above (figure-1)



**Figure :1 Anaemic status among study subjects**

**Table 1: Association between anaemia and Sociodemographic distribution of study subjects**

| variable                                | n=60 | Percentage of n | Chi-square |
|-----------------------------------------|------|-----------------|------------|
| <b>age</b>                              |      |                 |            |
| 17 years                                | 50   | 83.3%           | 5.006      |
| 18 years                                | 10   | 16.7%           | -          |
| <b>Type of family</b>                   |      |                 |            |
| Nuclear                                 | 60   | 100%            | -          |
| <b>Socio-economic status</b>            |      |                 |            |
| Below 5                                 | 60   | 100%            | -          |
| <b>Educational status of the family</b> | 39   | 65%             | -          |
| <b>occupation</b>                       |      |                 |            |
| Skilled employee                        | 54   | 89%             | -          |
| <b>Source of drinking water</b>         |      |                 |            |
| Hand pump                               | 60   | 100%            | -          |
| Borewell                                |      | 0               | -          |

- Age: As we have chosen a higher secondary school, so we have taken 17&18 years of participants with their consent.
- The category of the participants is not mentioned as all of them belong to kolam tribe which comes under scheduled tribes.

The mean age of the study participants was 17.23(standard deviation (SD)  $\pm 0.419$ ) years with a range of 17-18 years. All the study participants belong to Schedule Tribe and all are from a nuclear family. The majority of the participants belonged to the lower class as everyone belonged to daily wage workers and farmers (table 1).

**Table 2: Association between anaemia and knowledge of signs and symptoms of anaemia among study subjects**

| Knowledge questions on signs and symptoms and menstrual status | Percentage (%) Yes | Total n=60 yes | Percentage (%) no | Total n=60 no | Chi-square |
|----------------------------------------------------------------|--------------------|----------------|-------------------|---------------|------------|
| <b>Fatigue</b>                                                 | 20%                | 12             | 80%               | 48            | 32.914     |
| <b>Weakness</b>                                                | 20%                | 12             | 80%               | 48            | 33.958     |
| <b>Dizziness</b>                                               | 16.7%              | 10             | 83.3%             | 50            | 43.200     |
| <b>Pallor skin</b>                                             | 5%                 | 3              | 95%               | 57            | 35.439     |
| <b>Lack of concentration</b>                                   | 40%                | 24             | 60%               | 36            | 66.063     |
| <b>Shortness in breath</b>                                     | 6.7%               | 4              | 93.3%             | 56            | 38.571     |
| <b>Rapid heartbeat</b>                                         | 20%                | 12             | 80%               | 48            | 40.208     |
| <b>Irregular menstrual cycle</b>                               | 51.7%              | 31             | 48.3%             | 29            | 35.306     |
| <b>Irritation</b>                                              | 61.7%              | 37             | 38.3%             | 23            | 84.372     |
| <b>Depression</b>                                              | 20%                | 12             | 80%               | 48            | 23.542     |
| <b>Pallor in conjunctiva</b>                                   | 36.7%              | 22             | 63.3%             | 38            | 40.622     |
| <b>Pallor lips</b>                                             | 30%                | 18             | 70%               | 42            | 42.540     |
| <b>Brittle nails</b>                                           | 23.3%              | 14             | 76.7%             | 46            | 43.230     |

The knowledge regarding the signs and symptoms of anaemia among study subjects included fatigue, weakness, pallor of the skin, pallor of conjunctiva etc. Among this 20% of them were experiencing fatigue, weakness, depression, and rapid heartbeat. 51% of them were experiencing irregular menstrual cycle, and 40% of them said that lack of concentration is a factor in anaemia. And chi-square test was applied to correlate anaemia with all the parameters (table 2)

**Table 3: One-way t-test of the anaemic status**

| Test value = 0.15 |        |  |    |  |                |                 |                                           |         |
|-------------------|--------|--|----|--|----------------|-----------------|-------------------------------------------|---------|
|                   | t      |  | df |  | Sig.(2-tailed) | Mean difference | 95% confidence interval of the difference |         |
|                   |        |  |    |  |                |                 | Lower                                     | Upper   |
| Anaemic           | 40.241 |  | 59 |  | .000           | 10.32667        | 9.8132                                    | 10.8402 |

The results were analysed using a one-way t-test with the test value of 0.15 as its mean difference is 10.32 with a lower interval of 9.8132 and an upper interval of 10.8402. (Table 3).

## Discussion

In the present study among the total 60 study participants, the prevalence of anaemia was much higher, i.e. 75%. only 25% of the population had normal haemoglobin levels i.e. 12gm/dl. the mean haemoglobin level among the study participants was 10.4767(SD +1.98). (Puri et al., 2024) in their study found a prevalence of anaemia among pregnant women at 62.5%, with 33.0% having moderate and 29.2% having mild anaemia. Factors such as education, occupation, socio-economic status, parity, ANC visits, and dietary habits were not significantly associated.

(Baniya & Verma, 2022) Their study revealed an alarming 56.32% anaemia prevalence among school-going adolescent girls, highlighting concerns about reproductive potential due to limited knowledge about symptoms, causes, and treatments.

(Singh *et al.*, 2019) noted in their study that only 34.9% of the adolescent girls were aware of the anaemia and only 38.9% of the adolescent girls felt that it was a health problem. Only 7.5% of them knew the cause of anaemia. The author found that, after health education, there was a significant increase in the knowledge related to anaemia.

(Singh *et al.*, 2019) the study observed that most of the girls in the school were suffering anaemia. The majority of the adolescent girls even had symptoms of anaemia. Symptoms like pica and passing worms in stools were also experienced by a significant number of students. Hence regular health check-ups and health education regarding the prevention of anaemia and prophylactic Iron folic acid supplementation may help reduce the burden of anaemia among adolescent school girls.

(Upadhye *et al.*, 2017) From our study, it is concluded that the overall prevalence of anaemia among adolescent females was found to be 90%. It is seen that anaemia affects the overall nutritional status of adolescent females. There is a significant association of anaemia with socio-economic status and parents' educational status. It was found that the mean height and mean weight of subjects with anaemia were less as compared with that of subjects without anaemia; the difference was statistically significant. It was found that out of 270 girls, 220 girls (73.3%) had mild anaemia (Hb 10 to 12g/dl)

## Conclusion

The present study revealed that the prevalence of anaemia is higher (75%) among the adolescents in the Kolam tribe. This depicts that anaemia is a major public health concern among adolescent girls and an age group of 17-18 years in the growing phase is more prone to anaemia. This study does not show any relation with knowledge of anaemia in general, its signs and symptoms and the consequences and its prevention. The overall knowledge is quite low ranging from 20-50%.

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