ORIGINAL RESEARCH PAPER

Community Medicine

# PREVALENCE OF ANAEMIA AMONG FEMALE UNDERGRADUATE MEDICAL STUDENTS

KEY WORDS:

**Dr Pooja Prasad** Intern, Vydehi Institute of Medical Sciences and Research Centre, Bangalore, India.

**Dr. Chaitali Gore** Professor, Vydehi Institute of Medical Sciences and Research Centre, Bangalore.

**Dr. Sirisha Suresh** Intern, Vydehi Institute Of Medical Sciences And Research Centre.

**Dr. Pavan R** MBBS Graduate from Vydehi institute of medical sciences and research centre

**ABSTRACT**

**Background-** Anemia is a highly prevalent disease globally. South Asia accounts for the largest number of anemia cases. The largest burden of anemia all over the world is carried by India. It mainly affects women of reproductive age group. Adverse effects include cognitive and motor development. The aim of our study is to estimate the prevalence of iron deficiency anaemia. **Methodology-** This cross-sectional study was conducted in a tertiary care hospital for a period of 3 months. Approval was obtained from the Institutional Ethical committee. The data was collected with the help of a predesigned questionnaire. Written informed consent was obtained from the participants. Female students who are already diagnosed with anemia, kidney diseases, and hypothyroidism were excluded. Data was entered and analyzed using SPSS and the results were visualized in percentage **Results-** Mild anemia was present in 18.5% of the participants and 9.8% had moderate anemia. 71.4% of those who stayed in a hostel and in paying guest accommodation had mild/moderate anemia. 75.5% of those who stayed in the hostel and paying guest accommodation had pallor. 57.4% of those in the hostel and paying guest accomodation had a low iron level and 93.8% of the students with mild/moderate anemia had iron levels less than normal **Conclusion-** There is a higher prevalence of anaemia among students staying in hostel and paying guest accommodation than those staying at home with parents.

## INTRODUCTION

Anemia is a condition in which either the red blood cells are reduced or the oxygen-carrying capacity of the red blood cells is insufficient to meet the physiological needs of the body. [1]Hemoglobin is a protein in the red blood cells which carries oxygen and delivers it to all parts of the body. The normal hemoglobin value in males is 13.5-17.5g/dl and in females, it is 12-15.5g/dl. If the hemoglobin level is less than the normal range then the person can be called anemic, which can be further classified as mild, moderate, and severe. [2].

Anemia has multiple etiological factors that can be isolated and also acts as an indicator of health and nutritional status. The most common nutritional deficiency disorder is anemia. Anemia is seen in all age groups, gender, and races, but the prevalence being predominantly in females. It impairs the health of women increases the risk of maternal and neonatal adverse outcomes. [3]Hormonal changes, malnutrition, and the onset of menstruation in girls is one of the major reasons for anemia among women of reproductive age group, periods may be either heavy or scanty. [4]Many medical students also suffer from anemia as they have a long schedule of studying in college, clinical postings, and other activities.

These activities and the age-related development demands appropriate nutrition, and if the demand is not matched then there is a greater risk of deficiency. Also, there is a significant impact on their health depending on whether they are living in the hostel or day scholars. [5]the major symptoms of anemia are general malaise, fatigue, reduced work capacity, perception, learning difficulties, and poor concentration. It also adversely affects learning, behavior, and might also result in college absenteeism among students.

Past researches have pointed out that there is an increased incidence of anemia among women, and public health interventions are required to prevent it. Hence the current study was designed to study the prevalence of anemia among female medical students. [6]

### Material and methodology

This cross-sectional study was conducted in Bangalore for a period of 3 months. Approval was obtained from the Institutional Ethical committee. The data was collected with the help of a predesigned questionnaire. Written informed consent was obtained from the participants. Based on a previous study on nutritional deficiency anemia and its prevalence among female medical students the sample size was calculated using the following data: [8]

- Expected proportion- 0.33
- Precision- 6%
- Confidence interval- 95%
- Required sample size= 173.

### Inclusion criteria:

Female medical students between the age of 19 to 23 years.

### Exclusion criteria:

- female students who are already diagnosed with anemia
- female students who have been diagnosed with kidney diseases
- female students diagnosed with hypothyroidism

## RESULTS

The study included 173 female undergraduate medical students from 1 st and 2 nd year MBBS Demographic information like age, place of stay, and family size was collected. The average age of the students was 19 ± 2 years. Information about the residence of the students was taken and more than half, i.e. 54.9% of them were staying at home.

Also, Data regarding age at menarche, duration of the menstrual cycle, frequency of menstrual cycle, and hemoglobin was collected. 97.1% of them attained menarche between 10-14 years and 1.7% attained menarche before the age of 10 years. 4 % of the students had a duration of menstruation for more than 7 days. 6.9% of them had frequency of menstruation less than 20days and 20.2% had frequency of menstruation for more than 35days. 53.2 % of the students complained of dysmenorrhea. While 18.5% had mild anemia and 9.8% moderate anemia as shown in table 1.

**Table 1.Socio demographic details, Menstrual history, and Haemoglobin values:**

| Variable | | Number | Percentage |
|---|---|---|---|
| Age | <20 | 143 | 84.6% |
| | >20 | 30 | 17.3% |
| Place of stay | Home | 95 | 54.9% |
| | Hostel | 60 | 34.7% |
| | Paying guest | 18 | 10.4% |
| Family size | <5members | 164 | 94.7% |
| | >5members | 9 | 5.2% |
| Menarche | <10 years | 3 | 1.7% |
| | 10-14 years | 168 | 97.1% |
| Duration | <7days | 166 | 96% |
| | >7days | 7 | 4% |
| Frequency | 28-30 | 126 | 72.8% |
| | <20 | 12 | 6.9% |
| | >35 | 35 | 20.2% |
| Dysmenorrhea | present | 92 | 53.2% |
| | absent | 81 | 46.8% |
| Hemoglobin | 12-14g/dl | 124 | 71.7% |
| | 10-12g/dl | 32 | 18.5% |
| | <10g/dl | 17 | 9.8% |

The association between residence and anemia and also the association between residence and pallor was considered.

71.4% of those who stayed in a hostel and in paying guest accommodation had mild/moderate anemia as compared to 28.6 % who were normal and this association was statistically significant. Also 75.5% of those who stayed in the hostel and paying guest accommodation had pallor and this association was also statistically significant as shown in table

2. Busy and hectic college schedules along with homesickness anemia and pallor among them compared to those staying at home. Also, there is a change of food habits in students from different places who stay in hostels and paying guest accomodation, thus leading to lesser food consumption or consumption of more processed foods. Following is the results of these associations among students staying in hostels and paying guest accomodation

**Table 2: Association between Residence and Hemoglobin levels and pallor**

| | | Haemoglobin | | Total | | Pallor | | Total | |
|---|---|---|---|---|---|---|---|---|---|
| | | Normal | Mild/ Moderate | | p value 0.000 | Present | Absent | | p value 0.000 |
| Residence | Home | 81 | 14 | 95 | | 12 | 83 | 95 | |
| | | 65.3 | 28.6 | 54.9 | | 24.5 | 66.9 | 54.9 | |
| | Hostel | 33 | 27 | 60 | | 28 | 32 | 60 | |
| | | 26.6 | 55.1 | 34.7 | | 57.1 | 25.8 | 34.7 | |
| | Paying guest accomodation | 10 | 8 | 18 | | 9 | 9 | 18 | |
| | | 8.1 | 16.3 | 10.4 | | 18.4 | 7.3 | 10.4 | |
| Total | | 124 | 49 | 173 | | 49 | 124 | 173 | |
| | | 100.0 | 100.0 | 100 | | 100.0 | 100.0 | 100.0 | |

Next, the association between iron level and residence, iron level and hemoglobin was considered.57.4% of those in the hostel and paying guest accomodation had a low iron level and this was statistically significant.

Also 93.8% of the students with mild/moderate anemia had iron level less than normal as shown in **table 3**.

**Table 3: Association between Iron levels and residence and Hemoglobin levels**

| Iron level | | Residence | | | p value 0.000 | Haemoglobin | | | P value 0.005 |
|---|---|---|---|---|---|---|---|---|---|
| | | Home | Hostel | Paying guest accomodation | | Normal | Mild/ moderate | Total | |
| | Normal | 46 | 10 | 2 | | 55 | 3 | 58 | |
| | | 79.3 | 17.2 | 3.4 | | 44.4 | 6.1 | 33.5 | |
| | Less than normal | 49 | 50 | 16 | | 69 | 46 | 115 | |
| | | 42.6 | 43.5 | 13.9 | | 55.6 | 93.8 | 66.5 | |
| Total | 95 | 60 | 18 | 173 | | 124 | 49 | 173 | |
| | 54.9 | 34.7 | 10.4 | 100.0 | | 100.0 | 100.0 | 100.0 | |

## DISCUSSION

Anemia is the major health problem worldwide[7]It is estimated that 42mg of iron is lost per menstrual cycle as documented by various studies conducted in different areas which is the leading cause of anemia in females.[9]Many studies in the past were attempted to evaluate the prevalence of anemia in pregnancy, infants and adolescents but very few studies were conducted among the university students, who are the future of our country. For the planning and implementation of health strategies and policies for eradication of anemia, there is need to increase awareness among them about the effect of nutritional status on common health issues like anemia and its grave effects on learning, cognition, attention and behavior.[10]

According to our study, the prevalence of anemia in female undergraduate medical students is 28.3%. Of which 18.5% had mild anemia and 9.8% moderate anemia. A cross sectional study was conducted at The University of Faisalabad by Jawed S, et al. among 221 female medical students. Out of the total 221 female students, 33.4% of the students were found to be anaemic. Significantly high numbers of hostelites (39.2%) were anemic as compared to day scholars (23.1%).[6]

Rumi Debbarma, et al. conducted a cross-sectional study in Regional Institute of Medical Sciences (RIMS), Imphal. Out of 64 female students, 32 (50%) had normal hemoglobin level (>12gm/dl) and 14 (21.9%) had mild, 17 (26.6%) had moderate and 1(1.5%) had severe anemia.[10]. Karur et al. found the prevalence of anemia in female undergraduate students to be 44.8%[14]

Iron/iron-rich food intake frequency was statistically insignificant for the anaemic subjects (p=0.487, 95% CI 0.7-1.4) while it was significant in case of non-anaemic subjects (p<0.0001, 95% CI 1.9-4.6). Among the anaemic subjects, 49.4% consume iron/iron-rich food regularly, and 50.6% were irregular but, in the case of non-anaemic subjects, 74.6% were regular, and 25.4% were irregular.[11] Iron deficiency is the major public-health concern in the developing countries. In our study 66.5% of them have less than normal iron level and 93.8% of them have mild/moderate iron deficiency anaemia

In our study, there is a higher prevalence of anemia in students who were staying away from parents, i.e, in hostels and paying guest accomodation than those who are staying with parents. In a study conducted by Kannan B et al., anemia was present in 43% of the study population with 37% having mild anemia. The mean Hb% of the study population was 11.9gm/dl. This study has shown that students staying with parents or away from parents are not significantly different [12]. A study by Subramaniyan K et al. shows no significant difference in the type of residence.[13] However, there is some evidence that shows the prevalence of anemia more common in hostelites compared today scholars [6]

### Limitations

Some limitations of our study are that adequate previous

health history and family history could not be collected. Additional tests such as serum ferritin, serum iron and transferrin or total iron binding capacity(TIBC) were required for diagnosis of iron deficiency anemia.

## REFERENCES


1) WHO health topics- anaemia(internet), Geneva, world health organisation.2019 available from:https://www.who.int/topics /anaemia/en/ accessed on 12/11/2020
2) Mayo clinic-haemoglobin test(internet)(place unkown), mayo foundation for medical education and research, dec 22 2017,available from: https:// www.mayoclinic.org/tests-procedures/hemoglobin-test/ accessed on 14/11/2020
3) World health organisation, global nutrition targets2025: anaemia policy brief(internet)screen 1, 2014, available from: https://apps.who.int/iris/ 48556/WHO NMH NH accessed on 13/11/2020
4) Ma Q, Zhang S, Liu J, Wang Q,Shen H, et al.Study on the Prevalence of Severe Anaemia among Non-Pregnant Women of Reproductive Age in Rural China: A Large Population-Based Cross-Sectional Study Nutrients. 2017 Nov 28;9(12)
5) Sachin P, Arun S, a cross sectional study of nutritional anaemia among medical students in a medical college, at Bilaspur, Chattisgarh ; (njmr)april- june 2013;3(2):143.
6) Shireen J,Sundus T,Saba T and Anwar K. Frequency of nutritional among female medical students of Faisalabad;Pak J Med Sci. Mar-Apr2017; 33(2):399.
7) Saberi HR, Moraveji AR, Farajpour H. Relationship of anemia and serum ferritin in medical students. Int Arch Health Sci. 2016;3:43–48.
8) Shill KB, Karmakar P, Kibria MG, Das A et al. Prevalence of iron-deficiency anaemia among university students in Noakhali region, Bangladesh.J Health Popul Nutr. 2014 Mar;32(1):103-10. [PubMed]
9) Ratika N, Binu B. A comparative study on nutritional status of day scholar and hostelites adolescent boys with intellectual disability. Int J Food Sci Nutr. 2014;3:125–129. [Google Scholar]
10) D Rumi,P Pujayeeta et al. Anaemia among Medical Students of Regional Institute of Medical Sciences (RIMS), Imphal Sch. J. App. Med. Sci., 2016; 4(10C):3744-3748
11) Kumar S,K Palash et al. Prevalence of Iron-deficiency Anaemia among University Students in Noakhali Region, Bangladesh J Health Popul Nutr. 2014 Mar;32(1): 103–110.
12) Bhuvaneshwari K, Erli A. Prevalence of anemia among female medical students and its correlation with menstrual abnormalities and nutritional habits. DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20172003
13) Subramaniyan K.,G Melvin, S Deepika et al. Prevalence of anemia among health science students of a university in South India. DOI: http:// dx.doi.org/ 10.18203/2320-6012.ijrms20163337
14) Egesie UG ,Usar I, Johnbull T O. Distribution of ABO, Rhesus blood and haemoglobin electrophoresis among the undergraduate students of Niger Delta State University, Nigeria.Niger J physiol sci. Jun-Dec 2008;23(1-2):5-8. doi: 10.4314/njps.v23i1-2.54900.