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PREVALENCE OF ANAEMIA IN MBBS MEDICAL STUDENTS AT PUMHSW UNIVERSITY NAWABSHAH. A CROSS SECTIONAL STUDY.

Safdar Ali Pervez Tunio[1], Naveed Sattar Shaikh[2], Ghulam Mustafa Jamali[3], Shefa Lakho[4], Mujahid Ali Chandio[5], Nimra Ameen[6].

ABSTRACT:
BACK GROUND: Anemia is the global health problem most frequently encountered in women, particularly young adults, and is caused by various physiological as well as lifestyle causes. **OBJECTIVE:** To evaluate the burden and severity of anemia among female MBBS students at People's University of Medical and Health Sciences for Women PUMHSW Nawabshah, Pakistan. **METHODS:** A cross-sectional study was conducted that recruited a sample of 19 to 25-year-old female medical students. **RESULTS:** The mean age of subjects was 21.50 years with SD 1.65± years, the mean haemoglobin levels in non anaemic individuals was 12.58 g/dl and SD± 0.22 g/dl, in anaemic patients mean haemoglobin levels were 10.56 g/dl with SD± 1.11 g/dl. The results found a high prevalence rate of anemia among the students, with 43% of the respondents falling under the class of anemia. Most of these were mild anemia at 56%, followed by moderate 41%, and severe 3%. Contributing factors were likely poor intakes of food, irregular meal patterns, and hectic academic lives possibly influencing their nutritional status. **CONCLUSION:**Combating anemia among such populations would be important in the context of generating improvements in outcomes but also getting these children to perform better at school because symptoms such as fatigue and poor concentration by anemia could impact academic performance.
KEY WORDS: Anaemia, Young, Females, PUMHSW, Nawabshah.

Associate Professor, medicine KMC Khairpur.
Assistant Professor, Shaheed Mohtarma Benazir Bhutto Medical College Liyari, Karachi.
Assistant Professor, PUMHSW, SBA
Associate Professor, PUMHSW, SBA.
Assistant Professor, PUMHSW, SBA.
Associate Professor, PUMHSW, SBA.
Postgraduate student PUMHSW, SBA.

Corresponding Author: Safdar Ali Pervez Tunio,Associate Professor, medicine KMC Khairpur.Email: sufee1981@gmail.com

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INTRODUCTION

Anemia is a common public health problem, especially in young females worldwide through decrease in hemoglobin concentration below specific cut-offs that lowers the blood's oxygen-carrying capacity, and consequently cause symptoms like fatigue, weakness, and impaired cognitive functions. Anemia in women of childbearing age is often attributed to iron deficiency, but other nutrient deficiencies, genetic disorders, and chronic diseases can also lead to it[1].

The incidence of anemia among Pakistan is alarmingly high and has been documented particularly in the middleaged and females. The Pakistan National Nutrition Survey indicates that around 50% of the women of reproductive ages are suffering from anemia with iron deficiency as the main risk factor[2]. Female medical students are more liable for various reasons such as high academic stress, irregular eating habits, and less chances to maintain nutrition intake proper blend[3]. Anemia negatively influences the cognitive and physical outcomes, hence, badly affecting the academic performance of students[4].

Anaemia can be classified based on the concentration of hemoglobin Hb, depending on age, sex, and physiological status. WHO commonly acknowledges the severity of

anemia based on Hb levels, especially on the variation of cutoff values for nonpregnant women, men, and children[5].

Mild anemia Hb 11.0-11.9 g/dLis typically asymptomatic but contributes to fatigability, poor exercise tolerance, and decreased cognitive performance in some people[6].

Moderate Anemia Hb8.0-10.9 g/dL at this moderate level, symptoms of anemia are worse and become significant enough to interfere with some daily activities and even school functions due to severe fatigue and inability to focus[7].

However, severe anemia Hb less than 8.0 g/dL does not only pose a risk to major morbidity but also poses a threat of grave health problems, ranging from weakened immune functions to loss of physical and cognitive capabilities, that are extremely detrimental both academically and clinically to the students[8].

The seriousness attached to the health implications of this study leads towards establishing anemia prevalence rates among female MBBS students of the People's University of Medical and Health Sciences for Women PUMHSW, Nawabshah. The elucidation of prevalence and risk factors of anemia in such a population will help guide health intervention in any university that focuses on nutrition awareness, iron supplementation, and improvement in dietary intakes, hence well-being and academic performance of the students.

MATERIAL AND METHODS

Study Design and Setting: This cross-sectional study was carried out at the People's University of Medical and Health Sciences for Women PUMHSW in Nawabshah, Pakistan from July 2023 to June 2024.

Study Population: A total of 386 female MBBS students aged between 19 and 25 years were studied. The participants selected for this study were chosen through simple random sampling so as to be representative of the student population. The inclusion criteria were all female students in the age group specified, and those excluded comprised students who had chronic illnesses already diagnosed or who had recently been administered supplementary iron to exclude their confounding effects.

Data Collection: A pre-tested structured questionnaire was administered to collect information on the demographic, dietary habits, menstrual history, and a known history of anemia. Questions were also included in assessing the meal frequency, dietary intake, and consumption of iron-rich food, which may be possible risk factors.

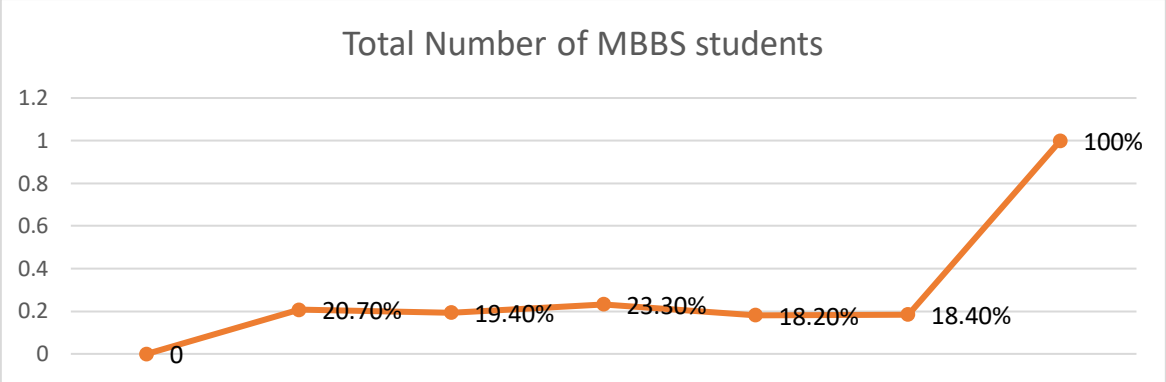
Venous blood samples were collected from the participants who participated in the study via professionals given training in the use of standard clinical procedures. The hemoglobin levels were measured with an automated analyzer hematology used at the diagnostic laboratory at the university. The Hb levels, according to WHO criteria, were classified to determine the severity of anemia by grading it to be mild, moderate, or severe.

Data Analysis: Data were captured and analyzed using SPSS software version 26. Descriptive statistics for demographic variables were conducted, and the Hb level was shown in terms of mean ± standard deviation. The prevalence of anemia was calculated based on the number of students who had Hb values lower than the threshold value for non-pregnant women as set by WHO: Hb<12 g/dL. The associations between the variables of demographic characteristics, particularly age, dietary habits, and menstrual history, among others, and prevalence of anemia, were all analyzed for the purposes of an inferential statistical analysis through the Chi-square tests. The level of statistical significance was set at <0.05.

Ethical Issues:

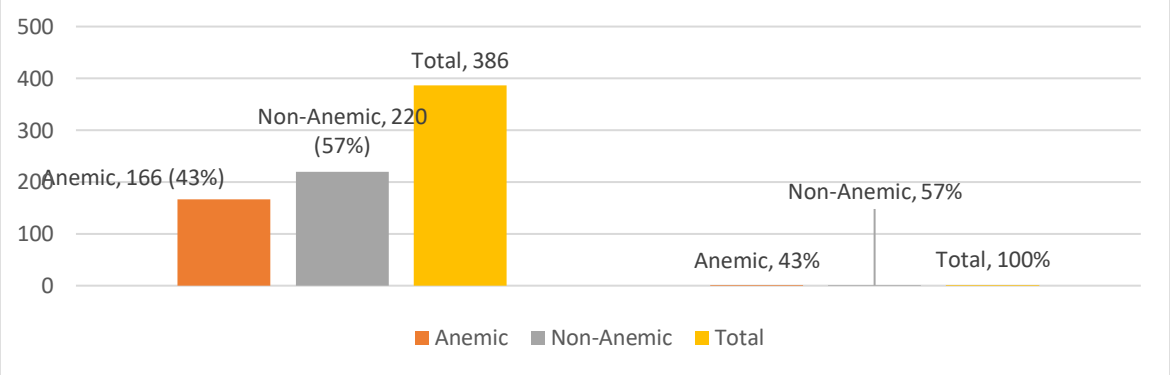
This study was approved by the PUMHSW Institutional Review Board. All participants were provided with information on confidentiality and a sense of voluntary participation to obtain informed consent. Participants diagnosed with anemia were referred to the university health clinic for further assessment and management.

RESULTS

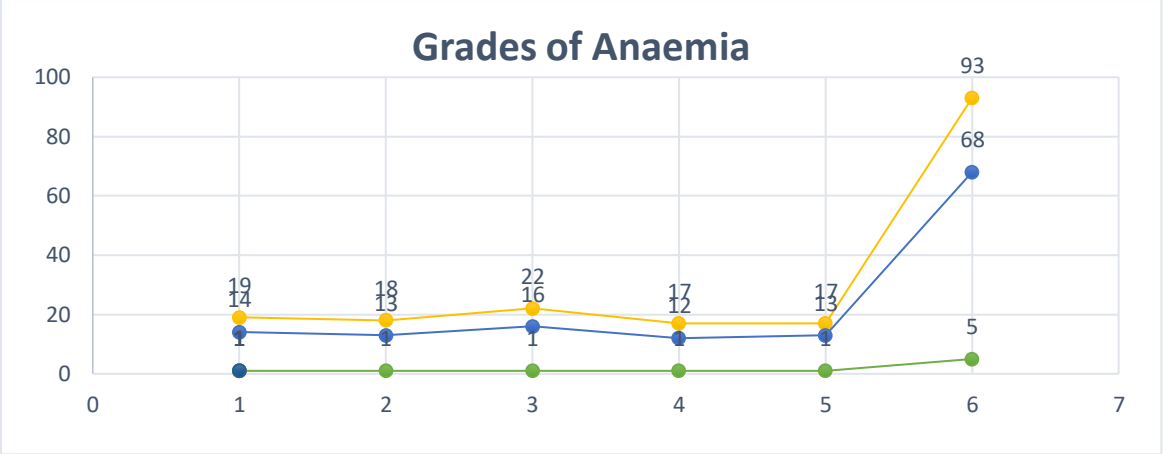


Academic Year	Total Students	19-20 Years	21-22 Years	23-24 Years	25 Years
First Year	80	40 50%	30 37.5%	7 8.75%	3 3.75%
Second Year	75	35 46.7%	30 40%	7 9.3%	3 4%
Third Year	90	38 42.2%	35 38.9%	10 11.1%	7 7.8%
Fourth Year	70	25 35.7%	30 42.9%	10 14.3%	5 7.1%
Final Year	71	22 31%	35 49.3%	8 11.3%	6 8.5%
Total	**386**	**160 17.8%**	**160 17.8%**	**42 4.7%**	**24 2.7%**

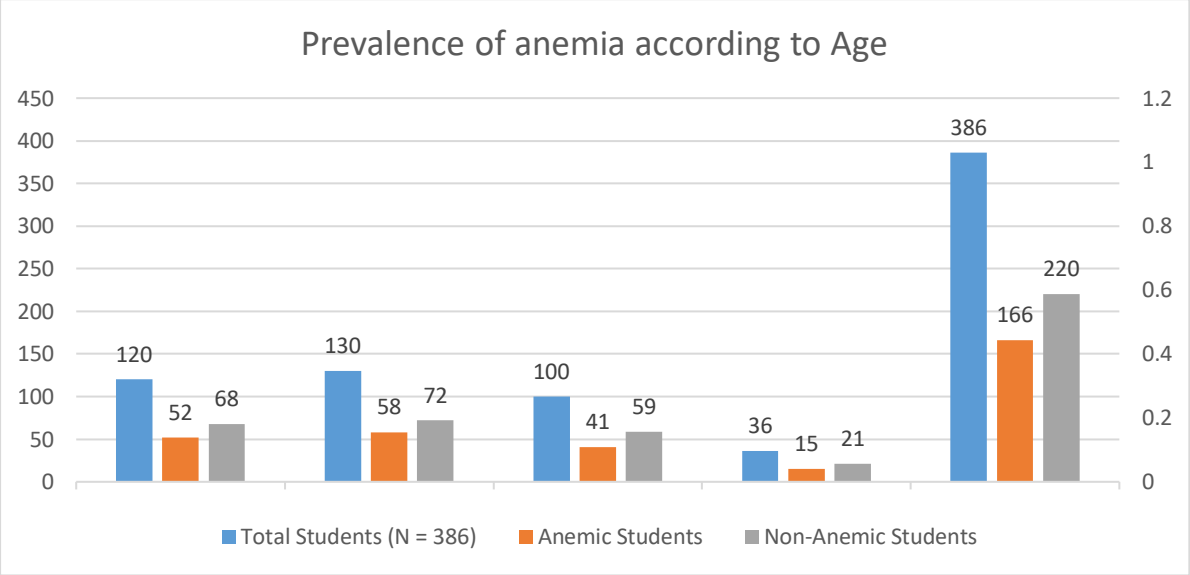
First Year has the largest number of students in the 19-20 years age group. The least number of students is there in the 23-24- and 25-years categories.In the second year, a similar distribution prevails, this time with a rise in the amount of students aged 21-22 years 40%.By Third Year, the most prevalent age of students is 21-22 years old, at 38.9 percent, and that makes natural sense, as the students are aging through their courses of study.Fourth and last-year students show more variation in terms of age: there is a big group of 42.9% and 49.3% respectively who fall in the 21-22 years age group. The proportion of students that fall in the 23-24 years of age also increases.

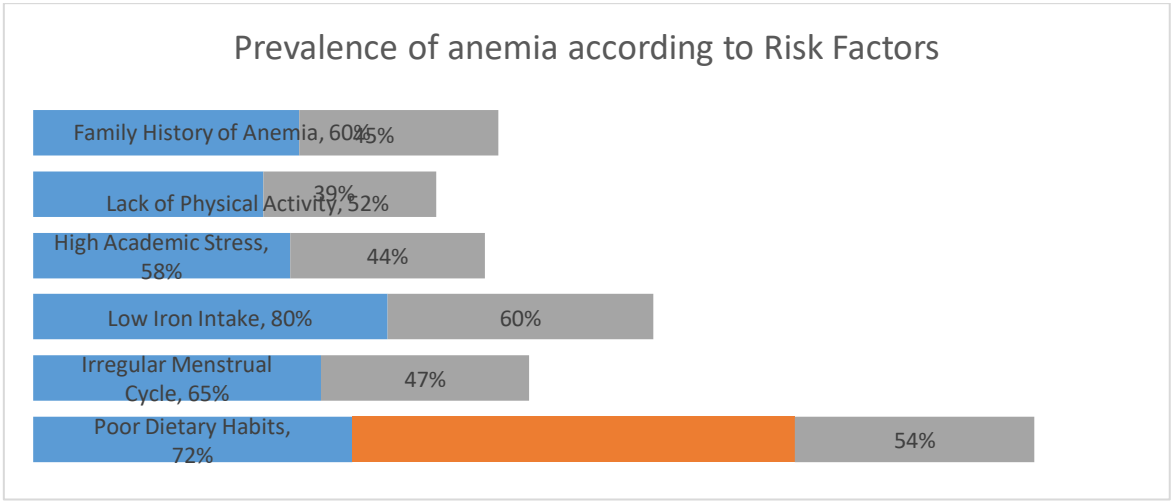


Of total 386 students, 166 were diagnosed to be anemic and that is 43% of the total no. of students, whereas remaining 220 57% students have been classified as non-anemic.



This graph represents the grades of anemia in students covering all years.From the totalanemic 43% 166students, 56% has a mild form of anemia, while 41% are with moderate severities, and only 3% are with severe anemia. The age-group distribution indicates that the maximum prevalence of anemia occurred in the 21-22 age group, and this was closely followed by the 19-20 age group, with 44.6% and 43.3%, respectively.Prevalence is slightly lower in the 23-24 and 25-year-old age groups, 41.0% and 41.7%, respectively.The total prevalence for anemia was found to be 43% and most of them have been reported from younger age groups of 19-22 years as shown below.





Of those with anemia, 72% said they have poor dietary habits characterized by irregular meals or low iron-rich foods in the diet, results to a 54% increased risk of anemia compared to non-anemic students.65% of anemic students experienced menstrual irregularities along with a 47% increased risk of anemia.Anemia cases in 80% of students had reported low intakes of iron, thus increasing their chance of anemia by 60%.58% of anemic students reported high academic pressure, which contributed 44% to the risk of anemia.Low physical activity was seen in 52% of all students and augmented the risk for anemia by 39%.60% of the anemic students reported a family history of anemia, having 45% higher risk than the non-anemic students.

DISCUSSION

There have been many previous studies regarding the prevalence of anemia in female medical students, especially from Pakistan. Part of which is very highly noted from the Karachi the prevalence rates were higher[9], at 60%, and were more to the 43% prevalence rate found in this study. Such consistencies within multiple studies suggest that there is a cause for concern about anemia as a significant health issue for women at the college or university level in Pakistan, when the prevalence levels could significantly be dictated by dietary practices and other socio-economic factors.

Anemia is one of the foremost problems in female MBBS students, and the present study reflects that the prevalence rate is as high as 43%. It is more or less in agreement with many studies conducted locally and worldwide. Furthermore, reports for the prevalence of anemia were found to be of 55% among female medical students in Vietnam[10]. All these studies point to the reality that the phenomenon of anemia is indeed so widespread, which means anemia is prevalent among the majority of female students all over the world, but especially among those in demanding academic programs, including medical education.

Comparison between the current study and studies conducted in other countries reveals that anemia is a worldwide problem in female medical students. In Nigerian, female medical students' anemia was found in 60%[11]. These studies therefore show that despite the prevalence differences in various regions, anemia remains a huge health concern for female students all over the world, especially those who are reading at environments requiring high cognitive loads.

Mild anemia was the most common type, followed by moderate and severe anemia. This was in a ratio of 56:41:3 respectively. This is consistent with reports in similar studies as in Nigerian female medical students, in which mild anemia was the most prevalent[11]. It thus implies that anemia is prevalent, even though most cases might not be severe but are significant and attention-worthy since they do interfere with general health and academic performance. The high proportion of mild to moderate cases is likely to be preventable through early intervention.

The prevalence among female medical students can be as high as 43.5%. Of all cases, mild anemia constituted 70%, moderate anemia formed 19%, and 6% were of the severe kind[12]. These findings are also very similar in total prevalence of anemia but with difference in grading of anaemia grading. Another study shows 51% prevalence of anemia in female medical students, out of them 36% to have mild anemia, 13% have moderate anemia, and 2% with severe anemia[13].

In a local study, prevalence of 43% anemia amongst female medical students was found. Mild anemia was 71%, moderate was 4%, and severe was 2%.[14].

Various local studies conducted in Pakistan and international research regarding the prevalence of anemia among female medical students show multiple similarities and differences. The prevalence rates are high in Pakistan at 35% to 50%[15,16], as compared to developed countries like the United States, where its prevalence is 23%[17]. However, the prevelance in Pakistan would closely mirror with other developing countries such as India 47%[18], Nigeria 50%[19], and Nepal 39%[20]. Hence, this indicates that anemia is the widespread problem in female medical students, especially where socio-economic issues prevail and nutritional imbalances are common.

Iron deficiency is the most common cause of anemia in female medical students as it is the most common nutritional deficiency globally. According to the study by Zubair et al., iron deficiency was pointed out to be the primary

cause of anemia among female students, which is congruent with the finding of the study where iron deficiency was the contributor[9]. Huy et al. also reported that iron deficiency was one of the main causes among Vietnamese students[10]. This strengthens the use of iron-rich diets and supplementation programs in combating such high trends of iron deficiency anemia among female students.

The dietetic aspects are important in the development of anemia, while the findings from this study reveal that one of the factors associated withanaemia is inadequate intake of iron among the female medical students. Among the participants, 60% had shown an insufficient intake of iron substantially and significantly associated with the high prevalence of anemia. This is a similar conclusion to some other research, in India and found similar issues with anemia and poor diet[21]. Probably, it also accounts for the low prevalence of iron-rich foods that are regularly consumed by most students, especially the vegetarians, or those who have limitations on certain meals.

A vegetarian diet has been said to be one of the most risk factors for anemia, lacking iron and other important nutrients. Female students who have diet patterns that restrict or exclude meat have higher levels of anemia; this is because iron in plant foods is very poorly absorbed[21,22]. The current study also comes up with the fact that dietary habits of female medical students were the most important reasons leading to anemia.

The other important variable that appears is the one associated with the socioeconomic status SES. It was detected in this study that students who come from families with lower SES have higher percentages of anemia, just as it was found elsewhere in Nigeria and South Korea[23,24].These studies highlight the fact that lower SES often goes with limited accessibility to food, healthcare, and supplementation, which has been shown to contribute to the anemia prevalence rate.

The impacts of socioeconomic status are more pronounced in the poorer areas where the school-going population is less likely to afford healthy diets and medical conditions. Mrema et al. 2020, and Patel et al., 2021 have documented the same trend in Tanzania and Kenya, respectively[23,25]. The students attending schools coming from a disadvantaged background show relatively higher rates of anemia.

Long hours of study and high stress levels among medical students also predisposed them to anemia together with irregular eating patterns. It was discovered that poor eating habits such as missing meals emerged as a consequence of long hours of study and great amounts of stress[26,27].

CONCLUSION

In summary, anemia remains a serious health issue among female MBBS students and the prevalence rate in this study was 43%. The conclusion from this research is in agreement with the local as well as international studies that the problem of anemia cannot be cured until iron deficiency, dietary pattern, socio-economics, and stress management are not accessed. Complete strategies, which may include nutritional education, supplementation programs, and stress reduction, may directly enhance health and wellbeing, which would consequently influence the performance of female medical students and improve the overall quality of life.

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