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Original Article

Prevalence, Severity of Anemia and Meal Skipping Behaviour among Undergraduate Students: A Cross Sectional Study

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ABSTRACT

Background: Iron Deficiency Anemia (IDA) is a significant global health challenge, particularly affecting women and students in developing countries. Despite its prevalence, IDA often remains underdiagnosed and overlooked, especially in regions with limited resources. The World Health Organization identifies iron deficiency as one of the leading risk factors contributing to global mortality.

Objective: This study aimed to evaluate the prevalence and severity of anemia and to assess dietary habits among undergraduate nursing students in a private sector institution in Pakistan, with a focus on understanding the gender differences in anemia prevalence.

Methods: A cross-sectional study was conducted involving 105 first- and second-year nursing students (47 females, 58 males) at a private nursing institution in Karachi, from August to December 2022. Data collection included demographic information, dietary habits, and a 3-milliliter venous blood sample for hematological analysis. Anemia was classified based on hemoglobin levels, with thresholds set at <12 g/dl for females and <13 g/dl for males.

Results: The prevalence of anemia was found to be significantly higher in females (53.2%) compared to males (15.5%). Among the anemic participants, 55.8% had mild anemia, 41.2% moderate anemia, and 2.9% severe anemia. The severity of anemia was predominantly higher among females, with 29.8% experiencing moderate and 2.1% severe anemia. Additionally, 60.9% of the students reported skipping breakfast, with a higher tendency observed among anemic females (51.0%).

Conclusion: The study highlights a considerable prevalence of anemia among female nursing students, with moderate anemia being more common. The association between anemia and dietary habits, particularly skipping breakfast, was evident. These findings underscore the need for targeted nutritional interventions and regular health monitoring in this demographic.

Keywords: Iron Deficiency Anemia, Nursing Students, Dietary Habits, Prevalence of Anemia, Gender Differences, Public Health.

INTRODUCTION

Iron deficiency anemia (IDA) is a significant public health issue worldwide, impacting both developed and developing nations. It stands as the most common nutritional problem, severely affecting human health (2). Approximately 30% of the global population suffers from iron deficiency (ID), with a notably higher prevalence of IDA among women compared to men (3). IDA is often a chronic and progressive condition that remains largely undiagnosed and lacks adequate treatment options. Those afflicted with IDA experience severe repercussions, including impaired growth and cognitive development, diminished mental and physical capabilities, reduced work capacity, and an overall decline in quality of life (4).

Numerous factors, both modifiable and non-modifiable, can influence an individual's iron balance. These factors include socio-economic characteristics like age, sex, marital status, income, and ethnicity, as well as diet, physical and mental health, medications, possible abnormalities, and genetic predispositions (5, 6).

There is a notable prevalence of anemia among students, as evidenced by several studies (7-10). Research suggests that most nursing students are young adults, typically aged between 19 and 21, and often come from lower middle-class backgrounds (7). It has been

observed that students frequently skip meals, a concerning trend (7, 11, 12), and this behavior may be influenced by factors like low household income, even when students are not necessarily lacking appetite (13).

In Pakistan, nurses constitute a significant portion of the healthcare workforce. The American Association of Colleges of Nursing highlights the critical role of nursing in aiding individuals to achieve, maintain, or restore optimal health and quality of life within the healthcare sector (14). Given the pivotal role nurses play in healthcare provision, maintaining their health is crucial (7). However, there is a paucity of data concerning the prevalence of IDA and its risk factors among undergraduate nursing students in Pakistan.

Addressing this research gap, the present study aims to assess and analyze a sample of undergraduate nursing students in the private sector in Pakistan. The objective is to determine the prevalence of anemia, its severity, and the dietary habits of these students, thereby contributing valuable insights into this under-explored area.

MATERIAL AND METHODS

In this cross-sectional study, we examined a sample of 105 first- and second-year nursing students from a private nursing institution in Karachi. The study spanned from August 2022 to December 2022 and focused on undergraduate nursing students aged 17 to 20. The inclusion criteria encompassed all nursing students enrolled in private nursing colleges. However, we excluded students who either did not provide their consent or had conditions such as hemoglobinopathies, menstruation disorders, or any other type of sickness that could affect the study's outcomes.

For the purpose of data collection, basic information regarding the participants' age, financial situation, and dietary preferences was gathered. In terms of biological data collection, a 3-milliliter venous blood sample was collected from each participant on the day they completed the questionnaire. These blood samples were then sent to the research and diagnostic laboratory of the Jinnah Sindh Medical University Hospital in Karachi. They were stored in EDTA tubes to facilitate hematological analysis. The hemoglobin (Hb) thresholds for determining anemia were set at less than 12 g/dl for females and less than 13 g/dl for males, as per the established criteria (15).

The data analysis was conducted using the Statistical Package for the Social Sciences (SPSS), version 22. The data was presented in terms of percentages and numbers, and the participants were categorized into anemic and non-anemic groups based on the World Health Organization (WHO) criteria (15). This approach enabled a comprehensive assessment of the prevalence and severity of anemia among the study participants.

Adhering to ethical standards, informed consent was obtained from each nursing student. The objectives of the research were clearly explained to them, and confidentiality of their personal information was strictly maintained. The study received formal approval from the concerned private nursing colleges, ensuring that all procedures were conducted in accordance with ethical guidelines and standards.

RESULTS

Table 1 illustrates the gender-wise distribution of anemia among the study participants. It shows that anemia is more prevalent in female students (53.2%) compared to male students (15.5%), indicating a significant gender disparity. While 25 female students were found to be anemic, only 9 male students were affected. Conversely, a higher percentage of males (84.5%) were found to be non-anemic compared to females (46.8%). Overall, out of the 105 students, 34 (32.3%) were anemic, and 71 (67.7%) were not.

Table 1 Gender-Wise Distribution of Anemia

Anemia Status	Females (%)	Males (%)	Total (%)
Present	25 (53.2%)	9 (15.5%)	34 (32.3%)
Absent	22 (46.8%)	49 (84.5%)	71 (67.7%)
Total	47 (100%)	58 (100%)	105 (100%)

Table 2 presents the severity of anemia among the undergraduate students. In terms of severity, mild anemia was observed in 19 students (55.8%), with both genders almost equally affected (females 21.3%, males 15.5%). Moderate anemia was solely present among females (29.8%), affecting 14 female students. Severe anemia was rare and only found in 1 female student (2.1%). This table highlights that moderate and severe anemia were exclusively found in females, suggesting a higher vulnerability among female students.

Table 2 Severity of Anemia Among Undergraduate Student

Severity	Females (%)	Males (%)	Total (%)
Mild	10 (21.3%)	9 (15.5%)	19 (55.8%)
Moderate	14 (29.8%)	0 (0.0%)	14 (41.2%)
Severe	1 (2.1%)	0 (0.0%)	1 (2.9%)
Total	25 (53.2%)	9 (15.5%)	34 (100%)

Table 3 focuses on the behavior of skipping breakfast and its relation to anemia, categorized by gender. It shows that skipping breakfast is notably more common among anemic female students (51.0%) compared to anemic male students (15.5%). Interestingly, a significant portion of non-anemic males (51.7%) also reported skipping breakfast, while almost all non-anemic females (98.9%) did not skip breakfast. This suggests a potential link between skipping breakfast and anemia, especially among female students.

Table 3 Gender-Based Behavior of Skipping Breakfast Among Undergraduate Students

Meal Skipping Behavior	Anemic Students (%)	Non-Anemic Students (%)	Total (n=105)
Skip Breakfast- Male	9 (15.5%)	30 (51.7%)	39 (67.3%)
Skip Breakfast- Female	24 (51.0%)	1 (2.1%)	25 (53.1%)
Total	33 (31.4%)	31 (29.5%)	64 (60.9%)

The results collectively indicate a higher prevalence and severity of anemia among female nursing students compared to their male counterparts. While over half of the female students were anemic, only a small fraction of male students showed signs of anemia. Additionally, the severity of anemia was more pronounced in females, with moderate and severe cases being exclusive to them. Furthermore, the data suggests a correlation between anemia and breakfast-skipping behaviors, especially among females, as a significant number of anemic females tended to skip breakfast. This gender-specific difference in anemia prevalence and related behaviors underscores the need for targeted nutritional interventions and awareness programs within this demographic.

DISCUSSION

In this study, we aimed to examine the prevalence of anemia and dietary behaviors among undergraduate nursing students in the private sector. Iron deficiency anemia (IDA) is recognized as a significant, yet often underdiagnosed, health issue, particularly affecting women globally (16). IDA is also listed by the WHO as one of the "Top Ten Risk Factors Contributing to Death" (17). While anemia is a well-recognized condition, its prevalence is considerably lower in developed countries (approximately 9%) compared to underdeveloped countries, where it affects about 43% of the population (18).

Our findings indicate a notable prevalence of anemia among undergraduate nursing students, particularly among females (53.2%) as opposed to males (15.5%). This is consistent with previous studies, such as one at Bengali University where 55.3% of students were found to have IDA, with a higher percentage in females (63.3%) compared to males (36.7%) (19). A similar trend was observed in a study of university students in Yemen, with 30.4% prevalence of IDA, more common in females (54.00%) than males (40.6%) (13). Further, studies from other underdeveloped nations also report a higher incidence of IDA among female students (22, 23). In contrast, only 3% of female university students in developed countries like Australia were found to have IDA (27).

Our study also sheds light on the severity of anemia among students. We observed that 21.3% of female undergraduates had mild anemia, 29.8% had moderate anemia, and 2.1% had severe anemia. This is in line with other research indicating that anemia affects a significant portion of teenage girls, with varying severity levels (30). However, the prevalence of mild anemia among medical students in Faisalabad, Pakistan, was reported as 77.5%, with moderate and severe anemia at 20.4% and 4%, respectively, indicating geographical variations in anemia prevalence (20).

The study also revealed that students who regularly skip breakfast are more likely to be anemic. This finding aligns with other research suggesting that breakfast habits significantly influence anemia prevalence (13, 34). In our study, 60.9% of students reported skipping breakfast, a figure comparable to a study in the Gaza Strip but higher than the 14.9% reported in Saudi Arabia (35).

Analytical observational research with teenagers indicates that skipping breakfast increases the likelihood of developing anemia (36). Regular breakfast consumption is crucial for meeting a significant portion of daily nutritional needs and reducing anemia risk. It also enhances cognitive function and attentiveness in students (37).

CONCLUSION

In conclusion, our research underscores that moderate anemia is more prevalent among female undergraduate nursing students, impacting their daily activities. The correlation between skipping breakfast and higher anemia risk highlights the need for dietary pattern changes. Further research with a larger sample size is necessary, considering the vital role nursing students play in healthcare and public health initiatives. Regular hemoglobin level monitoring is also recommended. The limitation of this study is its single-location focus and the lack of differentiation among various types of anemia.

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REFERENCES

1. Chandrakumari AS, Sinha P, Singaravelu S, Jaikumar S. Prevalence of anemia among adolescent girls in a rural area of Tamil Nadu, India. Journal of family medicine and primary care. 2019;8(4):1414.
2. Taha A, Azhar S, Lone T, Murtaza G, Khan SA, Mumtaz A, et al. Iron deficiency anaemia in reproductive age women attending obstetrics and gynecology outpatient of university health centre in Al-Ahsa, Saudi Arabia. African Journal of Traditional, Complementary and Alternative Medicines. 2014;11(2):339-42.
3. Khalafallah AA, Dennis AE. Iron deficiency anaemia in pregnancy and postpartum: pathophysiology and effect of oral versus intravenous iron therapy. Journal of pregnancy. 2012;2012.
4. Abbaspour N, Hurrell R, Kelishadi R. Review on iron and its importance for human health. Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences. 2014;19(2):164.
5. AlQuaiz AM, Gad Mohamed A, Khoja TA, AlSharif A, Shaikh SA, Al Mane H, et al. Prevalence of anemia and associated factors in child bearing age women in Riyadh, Saudi Arabia. Journal of nutrition and metabolism. 2013;2013.
6. Alquaiz A-JM, Khoja TA, Alsharif A, Kazi A, Mohamed AG, Al Mane H, et al. Prevalence and correlates of anaemia in adolescents in Riyadh city, Kingdom of Saudi Arabia. Public Health Nutrition. 2015;18(17):3192-200.
7. Hadaye RS, Dass R, Lavangare S. Health status and health seeking behaviour among urban and rural nursing students of a tertiary care hospital: a comparative study. International Journal Of Community Medicine And Public Health. 2018;5:4419-22.
8. AlSheikh MH. Prevalence and risk factors of iron-deficiency anemia in Saudi female medical students. Saudi Journal for Health Sciences. 2018;7(3):148-52.
9. Jawed S, Tariq S, Tariq S, Kamal A. Frequency of nutritional anemia among female medical students of Faisalabad. Pakistan journal of medical sciences. 2017;33(2):398.
10. Altaf B, Khan MB, Aftaab RK, Jawed S, Salam RMT, Amir F. NUTRITIONAL DEFICIENCY ANEMIA: ROLE OF JUNK FOOD IN NUTRITIONAL DEFICIENCY ANEMIA AMONG YOUNGSTERS. The Professional Medical Journal. 2018;25(07):1018-23.
11. Joshi D, Kushwaha A. Prevalence and Correlates of Nutritional Anaemia among Adolescent Girls of Distt. US Nagar, Uttarakhand. European Journal of Nutrition & Food Safety. 2018:348-60.
12. Jalambo MO, Hamad A, Abed Y. Anemia and risk factors among female secondary students in the Gaza Strip. Journal of Public Health. 2013;21(3):271-8.
13. Al-Alimi AA, Bashanfer S, Morish MA. Prevalence of iron deficiency anemia among university students in Hodeida Province, Yemen. Anemia. 2018;2018.
14. Rosseter R, Kuriakose D. Media Relations/Nursing Shortage. American Association of college of Nursing. 2012.
15. Organization WH. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Document Reference WHOGeneva, Switzerland. NMH/NHD/MNM/11.1. http://www. who. int/entity/vmnis/indicators/haemoglobin; 2011.
16. Friedman AJ, Shander A, Martin SR, Calabrese RK, Ashton ME, Lew I, et al. Iron deficiency anemia in women: a practical guide to detection, diagnosis, and treatment. Obstetrical & Gynecological Survey. 2015;70(5):342-53.
17. Jarrah SS, Halabi JO, Bond AE, Abegglen J. Iron deficiency anemia (IDA) perceptions and dietary iron intake among young women and pregnant women in Jordan. Journal of Transcultural Nursing. 2007;18(1):19-27.
18. McLean E, Cogswell M, Egli I, Wojdyla D, De Benoist B. Worldwide prevalence of anaemia, WHO vitamin and mineral nutrition information system, 1993–2005. Public health nutrition. 2009;12(4):444-54.

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19. Shill KB, Karmakar P, Kibria MG, Das A, Rahman MA, Hossain MS, et al. Prevalence of iron-deficiency anaemia among university students in Noakhali region, Bangladesh. Journal of health, population, and nutrition. 2014;32(1):103.
20. Shrivastava S, Bhattacharjee M, Panchmahalkar A. PREVALENCE OF ANAEMIA AMONGST NURSING STUDENTS-A SURVEY. EPRA International Journal of Research and Development (IJRD). 2022;7(3):44-7.
21. Rani NA, Arasegowda R, Mukherjee P, Dhananjay SY. Prevalence of Nutritional Deficiency Anaemia and Its Impact on Scholastic Performance among Undergraduate Medical Students. Journal of clinical and diagnostic research : JCDR. 2017;11(3):Bc21-bc3.
22. Jamali NH, Jamali AA, Ahmer A, Jamali AA, Shah K, Shaikh SU, et al. Iron deficiency anemia among the female students of Dolatpur town Sindh, Pakistan. Isra Med J. 2019;11(4):242-6.
23. Channar HB, Laghari ZA, Samo AA, Ujjan ID. Factors And Determinants Associated With Prevalence Of Anaemia In Adults In Karachi, Pakistan. JPMA. The Journal of the Pakistan Medical Association. 2023 Nov 1;73(11):2165-70.
24. Mehboob Q, Shahzed F, Arif W, Arif S. Frequency of Nutritional Anemia among Medical Students of Faisalabad Medical University, Faisalabad. Annals of Punjab Medical College (APMC). 2022;16(3):197-201.
25. Alzaheb RA, Al-Amer O. The prevalence of iron deficiency anemia and its associated risk factors among a sample of female university students in Tabuk, Saudi Arabia. Clinical medicine insights: women's health. 2017;10:1179562X17745088.
26. Al-Jamea L, Woodman A, Elnagi EA, Al-Amri SS, Al-Zahrani AA, Al-shammari NH, et al. Prevalence of Iron-deficiency anemia and its associated risk factors in female undergraduate students at prince sultan military college of health sciences. Journal of Applied Hematology. 2019;10(4):126-33.
27. Fayet-Moore F, Petocz P, Samman S. Micronutrient status in female university students: iron, zinc, copper, selenium, vitamin B12 and folate. Nutrients. 2014;6(11):5103-16.
28. Pandey S, Singh A. A cross sectional study of nutritional anemia among medical students in a medical college, at Bilaspur, Chhattisgarh. Natl J Med Res. 2013;3(2):143-6.
29. CHANNAR H, SAMO A, CHAPSI A, CHANDO K, HAQ M, MAHAR S. PREVALENCE OF ANEMIA ASSOCIATED WITH MENSTRUAL DISORDERS AMONG NURSING STUDENTS IN A PRIVATE NURSING COLLEGE AT KARACHI. Biological and Clinical Sciences Research Journal. 2023;2023(1):528-.
30. Habib N, Abbasi S-U-RS, Aziz W. An analysis of societal determinant of anemia among adolescent girls in Azad Jammu and Kashmir, Pakistan. Anemia. 2020;2020.
31. Hamali HA, Mobarki AA, Saboor M, Alfeel A, Madkhali AM, Akhter MS, et al. Prevalence of anemia among Jazan university students. International journal of general medicine. 2020:765-70.
32. Kanchana R, Pushpa K. Prevalence of anemia among 1st year MBBS students. National Journal of Physiology, Pharmacy and Pharmacology. 2019;9(1):74-7.
33. Pourghassem B, Kimiagar G, Abolfathi A, Vallaii N, Ghaffarpour M. Prevalence of iron deficiency, anaemia, and iron-deficiency anaemia in high-school students in Jolfa, East Azerbaijan. Food and Nutrition Bulletin. 2000;21(3):301-4.
34. Al-Jamea L, Woodman A, Elnagi EA, Al-Amri SS, Al-Zahrani AA, Al-shammari NH, et al. Prevalence of Iron-deficiency anemia and its associated risk factors in female undergraduate students at prince sultan military college of health sciences. Journal of Applied Hematology. 2019;10(4):126.
35. Abalkhail B, Shawky S. Prevalence of daily breakfast intake, iron deficiency anaemia and awareness of being anaemic among Saudi school students. International journal of food sciences and nutrition. 2002;53(6):519-28.
36. Andiarna F, editor Analysis of breakfast habits on the incidence of anemia. International Conference on Sustainable Health Promotion; 2018.
37. Kannan B, Ivan E. Prevalence of anemia among female medical students and its correlation with menstrual abnormalities and nutritional habits. Int J Reprod Contracept Obstet Gynecol. 2017;6:2241-5.