Int. j. adv. multidisc. res. stud. 2025; 5(1):486-488

Received: 03-12-2024
Accepted: 13-01-2025

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Anaemia in Relation to Body Mass Index among First Year Female Nursing Students of Government Nursing College, Civil Hospital Ahmedabad

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DOI: https://doi.org/10.62225/2583049X.2025.5.1.3680
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Abstract

Background:

Adolescents especially girls are most vulnerable toward the problem of anaemia. In this age groups, anaemia can result in impaired immune function and cause higher vulnerability to infections, reduction of physical resistance and tolerance to efforts, as well as damage to growth and intellectual capacity, hence difficulty to concentrate and memorize, which can lead to negative result in the learning development and performance. The association between anaemia and body mass index (BMI) is a measure of nutrition and health status of adults. Therefore, studying the haemoglobin level and its relationship to BMI highlights the importance of this study.

Objectives:

1. This study was to assess the prevalence of anaemia in first year nursing female students of civil campus Ahmedabad.
2. To find Association between Body mass index with anaemia among study group.

Material and methods:

This study was conducted among first year female nursing students (n=154) aged 18-20 years at public health lab of community medicine department of B.J medical college. haemoglobin level (g/dl) by sahli's hemoglobinometer and BMI (kg/m2) were estimated. Anaemia was defined as Hb content <12 g/dl. Subjects were classified by BMI categories as underweight (BMI <18.5 kg/ m2) Normal weight (BMI 18.5-24.99 kg/m2), overweight (BMI ≥25 kg/m2) and obesity (BMI ≥30 kg/m2) according to WHO. Then the relation between anaemia and BMI were statistically analysed. Semi structured Questionnaire was used for data collection.

Result:

Overall, 37.02% female students were anaemic. Of which 38.59% were underweight, 54.38% normal weight and 7.01% were above normal weight (over weight and obese). Mean value of haemoglobin was significantly decreased in underweight compared to overweight and obese ($p<0.04$) but Anaemia was not significantly associated with BMI. ($x2 =0.3444$, $p=0.8418$).

Conclusion:

The study concludes the occurrence of anaemia in undernourished individuals which were not significantly associated. Further studies are needed with larger sample size to document the factor that may be associated with anaemia in females.

Keywords: Anaemia, Body Mass Index, Adolescent Female Students

Introduction

In India, adolescent girls, who constitute a sizable segment of its population form a vulnerable group and are at a greater risk of morbidity and mortality. Adolescence has been defined by WHO as the period of life spanning the ages between 10-19. It is the formative period of life when maximum amount of physical, psychological and behavioral changes take place. This is a vulnerable period in the human life cycle for the development of nutritional anaemia. Anemia is widely prevalent in India, a developing country and affects both sexes and all age groups. Among adolescents, girls constitute a vulnerable group particularly in developing countries. The added burden of menstrual blood loss (normal/abnormal) precipitates the crisis too often [1].

When they grow in age this adverse health tendency continue to persist and impairs the health and well-being of women population and increase the risk of maternal, neonatal adverse outcome and child mortality.7 Adolescent stage is a period of life marked by specific developmental attribute such as rapid physical growth and development, physical, social and

psychological maturity.8 Increased iron demands during this stage of growth, excessive menstrual losses and nutritional deprivation, all aggravate and exacerbate pre-existing anemia and its ill effects [2].

Adolescents especially girls are most vulnerable toward the problem of anaemia. In this age groups, anaemia can result in impaired immune function and cause higher vulnerability to infections, reduction of physical resistance and tolerance to efforts, as well as damage to growth and intellectual capacity, hence difficulty to concentrate and memorize, which can lead to negative result in the learning development and performance. The association between anaemia and body mass index (BMI) is a measure of nutrition and health status of adults. Therefore, studying the haemoglobin level and its relationship to BMI highlights the importance of this study [2].

Objectives

1. To assess the prevalence of anaemia in first year nursing female students of civil campus Ahmedabad.
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Inclusion criteria:

- Female students of age group 18-20 years.
- Subject willing to participate in the study.

Exclusion criteria:

- Those who are absent and sick on the day of study.
- Who were not willing to participate in the study.

Results

Table 1: Distribution of Anaemia among Female Nursing Students by BMI Category

BMI (kg/m^2)	Haemoglobin content (g/dl)		Total
	<12g/dl	>12g/dl	
Underweight (BMI =<18.5kg/m^2)	22 [38.59%]	39 [40.20%]	61 [39.61%]
Normal weight (BMI= 18.5-24.9kg/m^2)	31 [54.38%]	49 [50.51%]	80 [51.95%]
Overweight and obese (BMI≥25kg/m^2)	4 [7.01%]	9 [9.27%]	13 [8.5%]
Total	57 [37.02%]	97 [62.98%]	154 [100%]

Chi-square value$(x)^2$= 0.3444
df=2, p=0.8418

This table shows the distribution of anaemia (haemoglobin content <12g/dl) among 154 female nursing students, categorized by BMI (underweight, normal weight, and overweight/obese). The results indicate that 37.02% of students were anaemic, with a higher prevalence among underweight (38.59%) and normal weight (54.38%) students. However, the association between anaemia and BMI category was not statistically significant (p=0.8418).

Table 2: Prevalence of Menstrual Problems among Female Nursing Students by BMI Category

Menstrual problems		
	Painful	Painless
Underweight 61 39.61%	25 40.98%	36 59.01%
Normal weight 80 51.95%	52 (65%)	28 35%
Overweight and obese 13 8.5%	8 61.53%	5 38.46%
Total 154 100%	85 55.19%	69 44.80%

This table shows the distribution of menstrual problems (painful and painless menstruation) among 154 female nursing students, categorized by BMI (underweight, normal weight, and overweight/obese). The results indicate that 55.19% of students experienced painful menstruation, with a higher prevalence among normal weight (65%) and overweight/obese (61.53%) students.

Table 3: Prevalence of Menstrual Irregularities among Female Nursing Students by BMI Category

Menstrual irregularities		
	Irregular	Regular
Underweight 61	10 (16.39%)	51 (83.61%)
Normal weight 80	13 (16.25%)	67 (83.75%)
Overweight and obese 13	4 (30.77%)	9 (69.23%)
Total 154	27 (17.53%)	127 (82.47%)

- 17.53% of the total population experienced menstrual irregularities.
- The prevalence of menstrual irregularities was highest among overweight/obese individuals (30.77%), followed by underweight (16.39%) and normal weight (16.25%) individuals.
- Conversely, the majority of students in each BMI category reported regular menstrual cycles, ranging from 69.23% among overweight/obese individuals to 83.75% among normal weight individuals.
- Overall, 37.02% female students were anaemic. Of which 38.59% were underweight, 54.38% normal weight and 7.01% were above normal weight (over weight and obese). Mean value of haemoglobin was significantly decreased in underweight compared to overweight and obese (p<0.04) but Anaemia was not significantly associated with BMI. (x^2 =0.3444, p=0.8418).

Discussion

The study revealed a significant prevalence of anaemia (37.02%), menstrual problems (55.19%), and menstrual

irregularities (17.53%) among female nursing students. Although anaemia was more common among underweight students, its association with BMI was not statistically significant.

Menstrual problems were more prevalent among normal weight and overweight/obese students, while menstrual irregularities were highest among overweight/obese individuals.

These findings highlight the need for targeted interventions to address these health issues among female nursing students, particularly those related to nutrition, menstrual health, and BMI management.

Conclusion

The study concludes the occurrence of anaemia in undernourished individuals which were not significantly associated. Further studies are needed with larger sample size to document the factor that may be associated with anaemia in females. Because of the potentially harmful effects of iron deficiency, underweight, overweight and obese adolescents should be routinely screened and treated as necessary. The final message of this study is move for health. Exercise keeps BMI feasible. BMI maintains normal iron status and adequate hemoglobin; in addition, iron status encourages adolescents to do more activities.

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