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Assessment of Risk Factors Associated with Obesity among Undergraduate Students

Farman Ali[1], Atiq Ur Rahaman[2],Tahmena Perveen[2], Salman Khan2, Nasir Ali[2], Saad Younas[2]

[1]*Department of Nursing,* Khyber Medical University, Peshawar

[2]*Department of Nursing,* People University of Medical and Health Science, Pakistan.

ABSTRACT

Background: Obesity has become a major public health concern globally, with young adults, particularly university students, being increasingly affected. Lifestyle changes during university life, including irregular dietary habits, low physical activity, prolonged sedentary behavior, poor sleep, and psychosocial stress, contribute significantly to weight gain. Understanding the risk factors associated with obesity in this population is essential for developing preventive strategies. This study aimed to assess lifestyle, dietary, behavioral, and sociodemographic factors associated with obesity among undergraduate students at the Prime Institute of Health Sciences (PIHS), Islamabad.

Methods: A descriptive cross-sectional study was conducted over two months, including 287 undergraduate students from nursing, pharmacy, paramedics, and allied health programs. A structured questionnaire adapted from the WHO STEPS instrument and the International Physical Activity Questionnaire (IPAQ-Short Form) was used to collect data on demographics, anthropometric measurements, dietary habits, physical activity, sleep patterns, and psychosocial behaviors. Anthropometric measurements were obtained by trained researchers. Data were analyzed using SPSS version 25, with quantitative variables presented as mean ± standard deviation and qualitative variables as frequencies and percentages. Associations between obesity and lifestyle or sociodemographic factors were assessed using chi-square tests and t-tests.

Results: Among participants, 28% were overweight and 15% were obese. Significant lifestyle-related risk factors included skipping breakfast, frequent consumption of fast food and sugar-sweetened beverages, low physical activity, prolonged sedentary time, poor sleep quality, and high perceived stress ($p<0.05$).

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Family history of obesity and urban residence were also associated with higher BMI.

Conclusion: Obesity among undergraduate students is influenced by multiple interrelated factors. Targeted interventions promoting balanced diets, regular physical activity, reduced sedentary behavior, improved sleep, and stress management are essential. Early implementation of health promotion strategies in university settings can reduce obesity prevalence and prevent long-term health complications.

Keywords: Obesity; Undergraduate Students; Lifestyle Factors; Pakistan.

Corresponding Author: **Atiq Ur Rahaman, Email**: atiq$9148@gmail.com.

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INTRODUCTION

Obesity has emerged as a major public health challenge worldwide, affecting individuals across all age groups. Among young adults, particularly undergraduate students, obesity has become increasingly prevalent due to behavioral, environmental, genetic, and psychosocial factors[1,2]. University life often introduces significant lifestyle changes, including irregular dietary habits, sedentary behavior, stress, and inadequate sleep, which contribute to weight gain and the development of obesity[3,4].

Globally, the World Health Organization (WHO) reports that obesity has nearly tripled since 1975, with over 650 million adults classified as obese in 2022[5]. Young adults entering university are particularly vulnerable, as this stage represents a transitional period where independence in food

choices and lifestyle behaviors can lead to unhealthy habits[6]. Concepts such as the “Freshman 15” highlight the tendency for first-year students to experience rapid weight gain[7].

In Pakistan, the prevalence of overweight and obesity among university students is rising. Unhealthy dietary practices, physical inactivity, and family history have been identified as significant contributors to obesity[8,9]. Similar patterns are reported internationally; studies in Saudi Arabia, China, and Bangladesh demonstrate associations between obesity and factors such as soft drink consumption, skipping breakfast, low physical activity, poor sleep, and urban residency[10,11,12]. Understanding these risk factors in undergraduates is critical, as this population represents the future workforce, and early interventions can prevent long-term complications, including cardiovascular disease, type 2 diabetes, and metabolic disorders.

METHODS

This study employed a descriptive cross-sectional design and was conducted at the Prime Institute of Health Sciences (PIHS), Islamabad, which offers programs in nursing, pharmacy, paramedics, and allied health fields. Data were collected over a two-month period. The study population included undergraduate students from the aforementioned programs who voluntarily consented to participate. Inclusion criteria comprised students aged 18 years or older, currently enrolled, present during data collection, and willing to provide lifestyle and health information. Exclusion criteria included pregnancy or postpartum (<6 months), chronic conditions affecting weight, use of medications influencing weight, acute illness, and refusal to participate.

A total sample of 287 students was calculated using Solvin’s formula. Purposive non-random sampling was employed. Data were collected using a structured questionnaire adapted from the WHO STEPS instrument, the International Physical Activity Questionnaire (IPAQ-Short Form), and validated dietary and lifestyle behavior tools. The questionnaire covered demographics, anthropometric measurements, dietary habits, physical activity, sleep patterns, and behavioral and

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psychosocial factors. Anthropometric measurements were obtained by trained researchers. Ethical approval was obtained from the PIHS Ethical Review Committee, and written informed consent was collected from all participants. Data analysis was conducted using SPSS version 25, with quantitative variables expressed as mean ± standard deviation and qualitative variables as frequencies and percentages. Associations between obesity and lifestyle or sociodemographic factors were analyzed using chi-square tests and t-tests.

RESULTS

Among the 287 participants, the mean age was 20.8 ± 2.1 years, with 58% female and 42% male students. Based on BMI, 28% were overweight and 15% were obese, while waist circumference indicated central obesity in 18% of students. Dietary habits revealed that 42% skipped breakfast regularly, 36% consumed fast food more than three times per week, and 29% consumed sugar-sweetened beverages daily. Fruit and vegetable intake was inadequate in 63% of participants.

Figure 1: BMI Distribution among Undergraduate Students (n = 287)

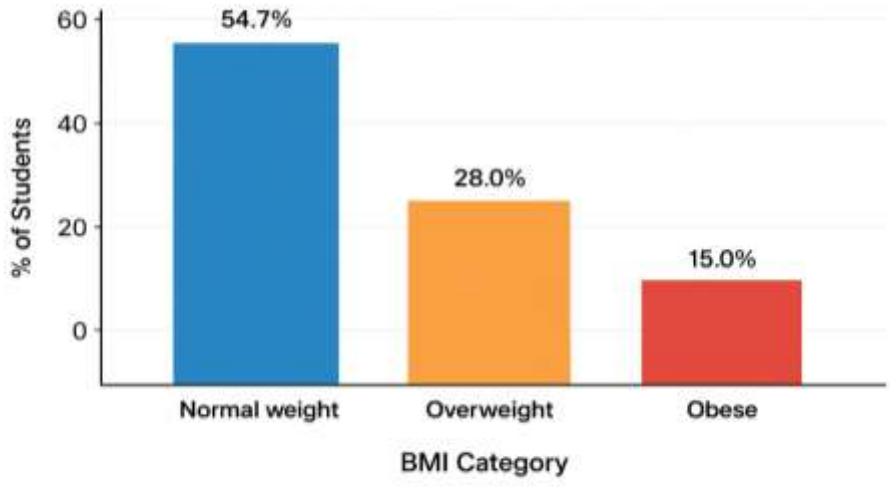

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Table 1: Lifestyle Factors Associated with Obesity among Students

Lifestyle Factor	% of Students	Risk Category	Prevalence
Breakfast Skipping	42%	Moderate Risk	42%
Fast Food Intake (>3/week)	36%	Moderate Risk	36%
Low Physical Activity (<3x/week)	47%	High Risk	47%
Sedentary Screen Time (>6 hrs/day)	54%	High Risk	54%
Poor Sleep Quality	33%	Moderate Risk	33%

- *Values represent the proportion of students reporting each lifestyle risk factor.*
- *Risk category is based on prevalence:*
    - Low Risk: <35%
    - Moderate Risk: 35–49%
    - High Risk: ≥50%

The table presents the prevalence of lifestyle factors associated with obesity among students. Sedentary screen time and low physical activity show the highest prevalence, indicating areas that require urgent intervention. Breakfast skipping, fast food consumption, and poor sleep quality are also notable contributors, representing moderate risk factors. The colored bars provide a quick visual comparison of prevalence across factors.

Physical activity analysis showed that 47% engaged in moderate-to-vigorous activity less than three times per week, and 54% reported more than six hours of daily sedentary screen time. Sleep analysis indicated that 39% slept less than six hours per night, and 33% reported poor sleep quality. High perceived stress was reported by 21% of students, while 18% engaged in frequent emotional eating. Statistical analysis revealed significant associations between obesity and skipping breakfast ($p<0.01$), low physical activity ($p<0.01$), high sedentary time ($p=0.02$), poor sleep quality ($p=0.03$), family history of obesity ($p<0.05$), and urban residence ($p<0.05$).

DISCUSSION

The study demonstrates that obesity among undergraduate students is influenced by multiple interrelated factors. Unhealthy dietary habits, including breakfast skipping and frequent fast food or sugar-sweetened beverage consumption, were strongly associated with higher BMI, consistent with previous research[13,14]. Low physical activity and prolonged sedentary behavior were significant contributors, reflecting common patterns among university students with academic and recreational screen-based activities[15,16].

Sleep duration and quality were also important determinants; students reporting short or poor-quality sleep were more likely to be overweight or obese, consistent with studies linking sleep deprivation to hormonal and metabolic disruptions[17]. Psychosocial factors, such as perceived stress and emotional eating, further contributed to obesity risk, emphasizing the interplay between mental health and lifestyle behaviors[18,19,20]. Family history and urban residence additionally highlighted the role of genetic predisposition and environmental influences.

These findings underscore the need for multifaceted interventions targeting diet, physical activity, sedentary behavior, sleep, and stress management. Universities can play a key role by implementing health promotion programs tailored to the specific needs of undergraduates, fostering healthy habits that may reduce the prevalence of obesity and prevent long-term health complications.

CONCLUSION

Obesity among undergraduate students is a multifactorial issue influenced by lifestyle behaviors, psychosocial stress, and sociodemographic factors. Early interventions promoting balanced diets, regular physical activity, reduced sedentary time, sufficient sleep, and stress management are essential to mitigate obesity risk. Family history and urban living further highlight the need for targeted strategies. Universities should prioritize comprehensive health promotion programs and

policies to create supportive environments that encourage healthy behaviors and improve overall student well-being.

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CONFLICT OF INTEREST

None

AUTHORS' CONTRIBUTION

All authors have equal contributions as per ICMJE.

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