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THE ASSOCIATION BETWEEN DIETARY HABITS, SLEEP PATTERNS, PHYSICAL ACTIVITY, AND OBESITY AMONG MEDICAL STUDENTS

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ABSTRACT:
Obesity represents a significant global health concern, impacting nations across all economic strata. Medical students face heightened risks of adopting detrimental habits due to the pressures of academic life, which can result in weight gain and associated health problems. The purpose of this study was to evaluate the prevalence of obesity among medical students at Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan and investigate its association with lifestyle factors including eating habits, physical activity levels, and sleep patterns. This was cross-sectional study including 148 medical students. Data was collected through a structured questionnaire assessing participants' dietary habits, physical activity, and sleep patterns. The mean Body Mass Index (BMI) was 23.53 kg/m²; 20.3% were overweight and 6.8% obese, more common in males. Fast-food intake was higher in these groups. No strong link existed between BMI and sleep, though obese students reported to have irregular sleep patterns. Physical activity was low, with 78.35% of overweight/obese students exercising 1–2 times weekly or not at all. This study identified a significant association between BMI and lifestyle factors among medical students, with males showing a higher tendency toward overweight and obesity. Elevated BMI was linked to frequent fast-food consumption, low levels of physical activity, and irregular sleep patterns. These findings underscore the need for targeted interventions that promote healthy eating habits, regular physical activity, and improved sleep hygiene.

Keywords: Obesity, BMI, lifestyle factors, physical activity, dietary habits, sleep patterns

INTRODUCTION

The incidence of obesity is a growing concern worldwide, affecting both developed and developing countries. Historically viewed as a condition primarily affecting affluent nations, but it is increasingly becoming prevalent in low- and middle-income countries undergoing urbanization and subsequent lifestyle changes. In the year 2005, projections indicated that approximately 937 million adults worldwide suffered from excess weight, with 396 million of these individuals meeting the criteria to fall in the category of obese adults. At that time, approximately 23% of the global population was overweight, and 9.8% were considered obese. If trends continued, it was estimated that by 2030, there would be 2.16 billion overweight (38% of the world's population) and 1.12 billion obese (20%)(3).

In 2022, the World Health Organization (WHO) released statistics indicating that approximately 2.5 billion adults globally, constituting 43% of the adult population, were categorized as overweight. Furthermore, projections for 2023 indicated that approximately 890 million adults, or 16% of the worldwide adult population, were experiencing obesity(4). Obesity is increasingly acknowledged as a complex issue influenced by genetic, environmental, and behavioral elements. This encompasses the intake of energy-dense, nutrient-poor foods, sedentary life style, and impulsive expenditure of energy. Furthermore, obesity significantly contributes to the risk profile for non-communicable diseases (NCDs), including cardiovascular conditions, diabetes, chronic respiratory diseases, and certain cancers (5, 6).

The public health impact of obesity is gaining recognition in Pakistan. The country has seen a change in eating and exercise habits resulting from urbanization, and the rate of obesity has dramatically increased. Lifestyle factors such as irregular eating habits, physical inactivity, and poor sleep patterns contribute to weight gain among young adults, especially medical students(7). Medical students are particularly susceptible to unhealthy behaviors that can lead them to obesity-related comorbidities later in life due to the psychosocial academic pressures and stress(8). Considering these issues, this study was designed aiming to assess the prevalence of obesity among medical students and explore how factors such as eating habits, physical activity, and sleep patterns correlate with obesity indicators like Body Mass Index (BMI). These correlation patterns need to be determined to create effective intervention programs to promote healthier lifestyles among the population of medical students, ultimately

minimizing the long-term burden of obesity-associated health conditions in Pakistan. In addition, the study aimed to bridge the existing gap in the existing body of knowledge and enhance awareness programs for the population of medical students. Healthier lifestyles among future doctors could have long-term public health consequences.

METHODS:

The research was conducted at Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro, Pakistan, from July 2024 to December 2024. This was a cross-sectional study including medical students studying in any year from first to final, using a structured questionnaire. The questionnaire included information regarding their exercise habits, sleep patterns, and dietary behaviors. Initially, 200 students were considered for inclusion; however, after applying the inclusion and exclusion criteria, the final participant pool was narrowed to 148 individuals, selected through a convenience sampling method.

Statistical analyses

Data were processed by using the Statistical Package for Social Sciences version 22.0 for Windows, presenting the results as means ± standard deviations (SD) and percentages. The analysis of variance for continuous variables between groups was conducted using independent t-tests, whereas the application of chi-square tests evaluated categorical data. Furthermore, correlation analysis explored the associations among physical activity, sleep duration, nutritional behaviors, and Body Mass Index (BMI). A p-value of less than 0.05 was designated as statistically significant.

RESULTS:

A total of 148 medical students were recruited in our study, with a median age of 20.34 years. The median height of the participants was 165.61 cm, while the median weight of the participants was 63.03 kg, resulting in a mean BMI of 23.53 kg/m². Out of 148 students, 16 students (10.8%) BMI falling in the category of underweight, 92 students (62.2%) had normal weight BMI, 30 students (20.3%) had overweight BMI, and 10 students (6.8) were obese (Table 1). Overweight and Obese students were predominantly male, and there was significant association was indicated by chi-square test between BMI and gender, only male students were obese, while no any female student found obese, 86.7% male students were overweight BMI and 13.3% female students were overweight BMI, and 66.3% male students were normal weight BMI and 33.7% female students were normal weight BMI, whereas 68.8% male students were underweight BMI and 31.2% female students were underweight.

A total of 56.65% of students classified as overweight or obese reported experiencing recent fluctuations in their weight, either as loss or gain. However, 43.35% of students did not report any recent changes in their weight. 78.35% obese and overweight BMI students were engaging in exercise daily 1 to 2 days per week or no exercise while 21.65% obese and overweight BMI students were engaging with 4 to 6 days per week, and 77.2% normal weight BMI students were engaging 1 to 2 days per exercise or no exercise, while 13.1% normal weight BMI students, were engaging themselves in 4 to 6 days per week exercise (Table 2), and there was significant relation between BMI and weight (p-value= 0.03), overall the obese or overweight are not reported to have daily exercise, while normal weight BMI students were more likely to engage in daily or frequent physical activity. There was no significant association found between BMI and sleep patterns (p-value =0.127). However, it was observed that students with a normal or overweight BMI typically achieved 7 to 8 hours of sleep each night. In contrast, those classified as obese exhibited more erratic sleep patterns, frequently logging either less than 6 hours or more than 8 hours of sleep.

Among students, 40% of those classified as obese and 76.7% of those who are overweight with respect to their BMI indulge in fast food at least once or twice a week. Obese students, however, show a tendency towards a more frequent pattern, consuming fast food daily or three to four times a week. In contrast, 56.5% of students with a normal BMI also partake in fast food once or twice weekly, yet 22.8% abstain entirely from fast food consumption each week and 20.7% of students with a normal BMI report eating fast food three to five times per week (Table 3).

Table 1. Distribution of Body Mass Index (BMI) categories

BMI Category	Male	Female	Total
Obese (>30 BMI)	10 (100.0%)	0 (0.0%)	10 (6.8%)
Overweight (25-29.9 BMI)	26 (86.7%)	4 (13.3%)	30 (20.3%)
Normal Weight (18.5-24.9 BMI)	61 (66.3%)	31 (33.7%)	92 (62.2%)
Underweight (<18.5 BMI)	11 (68.8%)	5 (31.2%)	16 (10.8%)
Total	108 (73.0%)	40 (27.0%)	148 (100.0%)

Table 2. Relationship between BMI categories and frequency of physical activity among students

BMI Category	None	1-2 Days	3-4 Days	5-6 Days	Every Day	Total
Obese (>30 BMI)	3 (30.0%)	5 (50.0%)	1 (10.0%)	1 (10.0%)	0 (0.0%)	10 (6.8%)
Overweight (25-29.9 BMI)	8 (26.7%)	15 (50.0%)	7 (23.3%)	0 (0.0%)	0 (0.0%)	30 (20.3%)
Normal Weight (18.5-24.9 BMI)	39 (42.4%)	32 (34.8%)	9 (9.8%)	3 (3.3%)	9 (9.8%)	92 (62.2%)
Underweight (<18.5 BMI)	5 (31.3%)	6 (37.5%)	2 (12.5%)	3 (18.8%)	0 (0.0%)	16 (10.8%)

Table 3. Fast Food Consumption Patterns Across Different BMI Categories

BMI Category	Never	1-2 Times	3-4 Times	5-6 Times	Daily	Total
Obese (>30 BMI)	2 (20.0%)	4 (40.0%)	3 (30.0%)	0 (0.0%)	1 (10.0%)	10 (6.8%)
Overweight (25-29.9 BMI)	0 (0.0%)	23 (76.7%)	3 (10.0%)	1 (3.3%)	3 (10.0%)	30 (20.3%)
Normal Weight (18.5-24.9 BMI)	21 (22.8%)	52 (56.5%)	15 (16.3%)	2 (2.2%)	2 (2.2%)	92 (62.2%)
Underweight (<18.5 BMI)	3 (18.8%)	12 (75.0%)	0 (0.0%)	0 (0.0%)	1 (6.3%)	16 (10.8%)

DISCUSSION

Our study identifies significant correlations between BMI and lifestyle factors such as gender, exercise habits, and dietary choices. The higher prevalence of obesity and overweight among male students is consistent with previous research, which indicates gender differences in body composition and metabolism (9). Further studies have shown that male medical students tend to have higher rates of obesity and overweight compared to their female counterparts (10). Research conducted in Greece found that a substantial proportion of both male and female medical students—specifically, 40% of males and 23% of females—had a BMI of 25.0 kg/m² or higher (11).

Most students classified as overweight or obese reported experiencing changes in their weight, likely due to efforts to manage their weight or due to inconsistent physical activity and dietary habits. However, our findings did not show a significant link between sleep duration and BMI. While other studies suggest that irregular sleep patterns contribute to obesity (12), our research found that although obese students exhibited more irregular sleep patterns, this factor was not significantly associated with BMI status.

Physical activity levels also varied significantly across the different BMI groups. Overweight and obese students engaged in less physical exercise compared to their normal-weight peers. This finding aligns with existing literature that emphasizes the importance of exercise in maintaining a healthy BMI and preventing weight gain (13). Moreover, low levels of physical activity have been identified as a primary contributor to obesity, with studies indicating that reduced energy expenditure plays a more critical role than increased food intake in weight gain development (14).

Eating habits were found to significantly influence BMI, especially regarding fast food consumption. Obese individuals showed a higher tendency to consume fast food compared to those with a normal weight. The link between fast food consumption and obesity is well established, mainly due to excessive caloric intake, poor nutritional content, and the convenience of fast food, all of which contribute to weight gain (15). A longitudinal study on eating patterns revealed that individuals who consumed fast food more than twice a week gained more weight over time and had higher levels of insulin resistance (16). Additionally, prolonged sedentary behaviors, such as excessive screen time, were linked to a greater likelihood of obesity. The Nurses' Health Study found that an additional two hours of television watching was associated with a 23% increase in the likelihood of obesity and a 14% rise in the risk of developing diabetes (17). In our study, students reported a median screen time of 2 hours daily, which may contribute to sedentary behavior and weight gain. These findings highlight the need for health promotion initiatives, especially those that encourage a balanced diet, regular physical activity, and quality sleep to support weight management and overall well-being among medical students.

CONCLUSION

There was a significant association between lifestyle factors and the BMI of medical students, with a higher incidence of obesity and overweight observed in male students. Frequent fast food consumption, irregular sleep patterns, and excessive screen time were found to contribute to higher BMI levels. Additionally, physical activity levels were notably low, especially among obese and overweight students, underscoring the urgent need for targeted interventions to promote healthier lifestyle choices.

Conflict of Interest

Authors declare no conflict of interest.

Ethical consideration

The study was approved by the local Ethical Review Committee.

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