Prevalence of Obesity and Associated Risk Factors Due to Physical Inactivity Among Medical Students in Faisalabad

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ABSTRACT

Obesity is defined as having a body mass index (BMI) that is higher than what is considered normal and healthy for a certain height. While excess body fat is typically the cause of obesity, factors such as fluids, excess muscle, or bone density may also contribute to obesity. The main purpose of this study was to determine the prevalence of obesity and some associated risk factors among the medical students at universities of Faisalabad due to their inactive life style. In this analytical cross sectional study, a convenience sampling technique was used to collect data from 290 medical students. The criteria included students aged between 19-23 years, while those with medically diagnosed psychological issues and trauma were excluded. Data was collected using a self-administered questionnaire, which was distributed to all the obese medical students who were conveniently accessible and could comprehend the material. The data was evaluated using the Statistical Package for the Social Sciences (SPSS) software, version 17. The results showed that 33.0% of the students were of normal weight, 23.0% were overweight, 40.5% were obese and 3.4% were severely obese. A significant association was found between obesity of the respondents and their perception about the risk factors.

Keywords: health, obesity, overweight, Pakistan, physical inactivity

1. INTRODUCTION

Obesity is a severe medical condition characterized by an increase in body weight due to immoderate accumulation of body fat, which occurs when the caloric value of food intake is more than that of energy output. It

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is one of the most preventable causes of death, yet many individuals are unaware of their weight status, leading to a range of health issues. Obesity is a serious public health issue that is usually overlooked [1]. An extra deposit of fat around the viscera is known as central obesity or belly fat, in which the abdomen bulges outward. It occur due to the extra fat deposits, center of gravity of body shifted forward from the pot, and weakness of various muscles (specially muscles of abdomen), due to sedentary behavior and physical inactivity. All these factors cause the curvature of lower spine to exceed than the normal and cause pain as the person attempts to attain an upright posture. Likewise, the extra fat deposits around the neck has been associated with increased rate of mortality. Such conditions develop mostly from decreased physical activity and excessive caloric intake [2].

Numerous factors contribute to excessive body weight, including diet, family history, sedentary behavior, and psychological behavioral patterns. The role of health professionals is very important in promoting a healthy life and normal weight among the population. However, research indicates that obesity is more prevalent among medical students and healthcare workers in many countries. Obesity is a chief non contagious disease in Pakistan [3].

Major public health problem among young students is unhealthy eating habits. As students transition from college to university life, they often face chronic stress and time constraints, as most of their time is consumed in studying and some other sedentary activities. These pressures can hinder the adoption of healthy lifestyles, leading to substance abuse and poor eating habits. Obesity, a health condition that involves the multifaceted interaction of bio psychosocial and different environmental factors, is associated with mobility and functional disability and impairment. Individuals with obesity suffering from mobility disabilities often report a reduced health related quality of life compared to those with normal and healthy weight [4].

Calorie reduction plays an important role in combating obesity. It is important to replace high-calorie foods with lower-calorie alternatives and to adopt healthier eating habits. In addition to changing the kind of food, many patients may need to change their eating habits like when, where, and how they eat [5]. Students should be educated about appropriate diet plans that outline not only what to eat but also when and how to eat [6]. Exercise and physical workout along with healthy diet is very important to lose weight. It has very a beneficial effect on both body and mind. Exercise not

only boosts metabolism but also alleviates mental stress and improves mood.

The purpose of the present study was to assess the prevalence of obesity among medical students, identify associated risk factors, and raise awareness about the importance of physical activity and encouraging students to modify their lifestyles.

2. METHODOLOGY

2.1. Study Setting

This study was conducted among the medical students of government and private universities of Faisalabad, Pakistan.

2.2. Duration of Study

This study took a time period of 06 Months; a major portion of time was spent on data collection procedure.

2.3. Study Design

It was a cross sectional study design.

2.4. Sample Size

A sample size of 290 participants was selected [7].

2.5. Sampling Technique

Sample was selected using a convenience sampling technique. The questionnaire was distributed to all the obese medical students who were conveniently accessible. It was filled by the medical obese students who were able to understand it.

2.6. Data Collection Tools

- Self-administered questionnaire
- Calculator to calculate the BMI
- Weight machine
- Inches tap to measure the height

2.7. Selection Criteria

2.7.1. Inclusion Criteria. Data was collected from:

- Obese students of Faisalabad only.
- Medical students aged 19-23 years.
- All obese students who understood the questionnaire, research and its purpose, and who were willing to provide information were given the questionnaire or asked questions. Consent forms were signed by students who filled the forms and it was attached with each questionnaire. Participants were informed about the research background, its use, and its purpose.
- Students were assured that providing their names and contact numbers was optional, and if they chose to provide this information, it would remain confidential and not be disclosed in the research.
- Both female and male students were included.
- Students from both government and private universities were included.

2.7.2. Exclusion Criteria. The following individuals were excluded from the study:

- Those with any degenerative diseases or hereditary/ genetic causes of obesity.
- People with medically diagnosed psychological problems.
- Female students who were pregnant.
- Students who refused to give consent and participate in the study, even after receiving the essential research material.

2.8. Data Collection Procedure

This study was conducted in government and private universities of Faisalabad to assess the prevalence of obesity among the students due to sedentary behavior. The study used a convenience sampling technique with a sample size of 290 participants. Prior to data collection, informed consent was obtained from the heads of departments at each medical college to facilitate a better understanding of the study's purpose.

Data were collected using a self-administered questionnaire, which included 17 questions covering demographic information, study hours, physical activity levels, risk factors, and meal frequency, all aligned with the study protocol. The questionnaire received approval from a statistician

and a supervisor before implementation. The primary aim of the study was to identify the risk factors related to obesity and physical inactivity. Inclusion criterion encompassed medical students who studied for at least 6-8 hours daily and were obese due to unhealthy lifestyle. Exclusion criteria included pregnant female students and both male and female students with wrist disorders, such as arthritis. After completing questionnaire, the Body Mass Index (BMI) of the students was calculated using a measuring tape, weighing scale, and calculator. The rights and welfare of participants were prioritized, allowing them to withdraw from the study at any time for any reason. Participants were informed about the study results, and the research posed no potential harm or risk to them. The study ensured the respect and dignity of all respondents, maintained participant anonymity, and communicated with transparency and honesty.

3. RESULTS

Table 1. Frequency Distribution of Obesity

	Frequency	Percent
Normal	96	33.0
Overweight	67	23.0
Obese	118	40.5
Severely Obese	10	3.4
Total	291	100.0

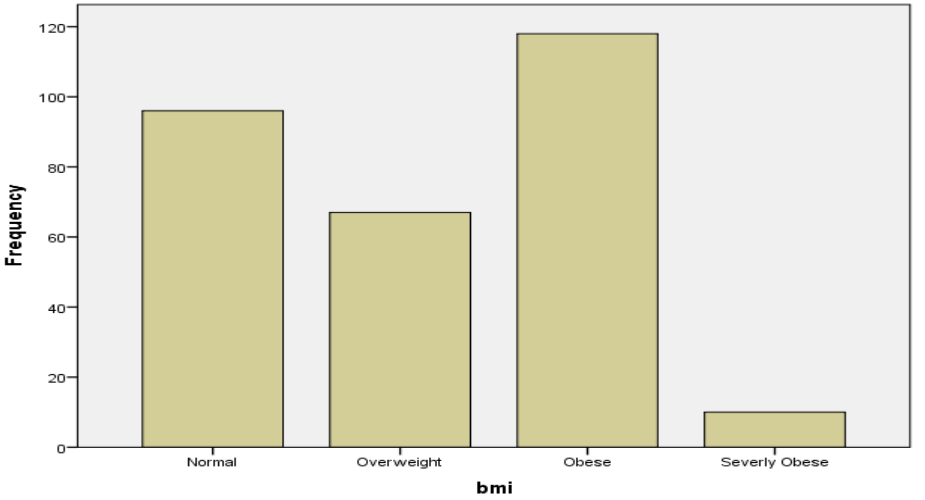

Figure 1. BMI Distribution

Table 1 shows that 33.0 % of the students were normal, 23.0% were overweight, 40.5% were obese and 3.4% were severely obese.

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Table 2. Distribution of Respondent According to Association between Obesity and Risk Factor in Medical Students

Obesity	Risk Factor		Total
	Yes	No	
overweight	36	20	56
obese	87	88	175
Severely obese	35	25	60
Total	158	133	291

Chi-square = 4.126, *d.f.* = 2, *p*-value = .040, Gamma = .061

Table 2 presents the association between obesity of respondents and their perception about the risk factors. Chi-square value shows a significant association between obesity of the respondents and their perception about the risk factors. The Gamma value shows a positive relationship between the variables.

4. DISCUSSION

The present study aimed to determine the prevalence of obesity and its associated factors among 290 medical students of Faisalabad, including both government and private sectors. The analysis and result of this study concluded that medical students due to lack of physical inactivity, showed the high prevalence of obesity. Physical inactivity was major contributing factor in causing obesity. The results indicated that medical students, lacking physical activity, were more likely to suffer from obesity. Associated factors like sedentary lifestyle, bad eating habits and physical inactivity were linked to the prevalence of obesity found in this study [8].

The results of the study were consistent with the previous study, which also highlighted a high obesity rate among medical students. The current study supports prior findings that poor life style, bad dietary habits and lack of physical activities caused obesity. Students who were unable to maintain a healthy lifestyle due to academic burdens were more prone to obesity. This study concluded that the high prevalence of obesity among medical students is largely due to their sedentary behavior and physical inactivity.

Previous research has similarly shown that medical students exhibit higher rates of obesity [9]. A literature review identified causative factors such as stress, lack of self-consciousness and addiction are associated with obesity among medical students because stress is one of the major factors in students' lives, due to academic demands [10]. Present study provides that medical students between 21-23 years of age reported more obesity symptoms. Another previous study substantiated our findings, reported that prevalence of obesity was high among medical students and also found out that causative factors like repetitive snack intake, more junk food, high caloric intake and lack of extra curriculum activities were all associated with developing obesity [11].

Students consuming high-calorie diets and not engaging in regular exercise showed a significant association with obesity prevalence [12]. Other studies similarly indicated that students who spent more time in leisure activities and consumed junk food were more likely to develop obesity-related symptoms compared to those who ate less junk food and consumed lower-calorie diets. The prevalence of obesity among students was 40% and prevalence of overweight was 23% in our study. This prevalence was higher in our study than a previous study [13] which showed that prevalence of obesity among students was 6.5%, and overweight was 22.2%. Another study showed that the prevalence of obesity and overweight was 12.4% and 14.7%, respectively [14]. Another study showed that the prevalence of obesity and overweight was ranging from 1 to 12.9% and 9 to 27.5% respectively [15]. Comparable to the percentage of these previous studies, the prevalence of obesity and overweight was higher in our study. The previous study supported the results of our study. In that study, main cause of obesity among medical students was highlighted. It was that, medical students take less part in physical activities and their frequency for activities was very low [16] Our study demonstrated the percentage of physical activities among medical students. 22.0% students enrolled were practicing the physical activity daily, 35.7% students were not taking part in any physical activity while 42.3% students were practicing on-off physical activity. This percentage shows that the high prevalence of obesity among medical students due to physical inactivity is positive. This present study gave the same results.

A new associated factor of obesity in this study that was not much highlighted in previous researches was the duration of hours spent on study

by students. This limited their ability to engage in physical activity, contributing to obesity. Another study similarly highlighted that academic stress prevents students from focusing on healthy activities, leading to obesity [17]. Our study found that 1.7% of students spent 2-4 hours studying, 7.9% spent 4-6 hours, 69.8% spent 6-8 hours, and 20.6% spent even more time studying. While comparing our study results to another study, we found out that according to previous researches, prevalence obesity among medical students was high because they spent too much time on television during their free time instead of doing any physical activity during that time [18]. This study showed that the modernized lifestyle have destroyed the health and nutritional behavior of students. In conclusion, this study affirmed that high prevalence of obesity among medical students is due to physical inactivity.

4.1. Conclusion

This study concluded that the risk of obesity increases due to unhealthy life style and physical inactivity. It also concluded that 71.8% prevalence rate was found in the medical students. Medical students' age 19-23 years were included in more risk group than non- medical students. Moreover low physical activity rate, overeating, and psychological issues are the main factors in medical students and contributing to obesity. Almost three–fourth of the study sample comprised of female students. At multivariable analysis level, the variables which were found to be significant are level of physical activity, gender, diet, eating habits, and hours of study etc. Students who spent more studying hours and who took more number of meals per day while being inactive all the day, experience more symptoms associated with overweight or increased BMI. In the end Physical activities are necessary for body and mind, it keeps them healthy. Physical activity is the major treatment to avoid obesity. Aerobic exercise can help burn fat through exercise, which keeps the students relax, with little risk of rebound. Hence aerobic exercise is more appropriate for obese college students to lose weight.

4.2. Limitations

The study encountered several limitations:

- The young volunteers were uncooperative, making data collection difficult.

- Lack of availability of participants.
- Some participants were unwilling to use waist and height measurements to calculate BMI.4. Male students were less interested in completing the questionnaire compared to female students.

4.3. Strength

- Ethical consideration was taken into account during research.
- Awareness was raised about physical activity, healthy diet, and risk factors etc, thus improving the quality of life.

4.4. Recommendations

- The outcomes of the study could have been improved if we engaged the participants in some exercise or physical activity. However, due to time constraints, this task was left incomplete. Future research should include physical activity or exercise programs to better understand obesity prevalence and outcomes.
- It is advised that additional research be done on the related risk factor for future studies.
- In order to address the health problems and other risk factors brought on by obesity and an active lifestyle, interventions or fitness programs should be implemented.
- Students who experience obesity while studying might adjust their workstations during class times to avoid movement restriction.
- Physical exercise can raise overall energy expenditure, which can assist with weight loss or maintaining energy balance. Exercise reduces body fat overall and waist fat, which delays the onset of abdominal obesity.
- Consuming less bad fat and more good fat, fewer processed and sugary foods, more servings of fruits and vegetables, and dietary fibers are just a few of the healthy eating habits that can help avoid obesity.
- Osteoarthritis, fatty liver disease, sleep apnea, high blood pressure, heart disease, and type 2 diabetes are among the chronic diseases that obesity increases the risk of developing.

CONFLICT OF INTEREST

The author of the manuscript has no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

DATA AVAILABILITY STATEMENT

The data associated with this study will be provided by the corresponding author upon request.

FUNDING DETAILS

No funding has been received for this research.

REFERENCES

[1] Selvaraj K, Sivaprakasam P. A study on the prevalence of overweight and obesity among medical students of Kanchipuram District. *Natl J Res Community Med*. 2013;2:140–144.

[2] Bird PJ. Fat deposits on hips and thighs of women and around stomach of men. Scientifc American Website. https://www.scientificamerican. com/article/why-does-fat-deposit-on-t/. Updated May 15, 2006.

[3] Khan ZN, Assir MZK, Shafiq M, Chaudhary AG, Jabeen A. High prevalence of preobesity and obesity among medical students of Lahore and its relation with dietary habits and physical activity. *Ind J Endocrinol Metabol*. 2016;20(2):206–210. https://doi.org/10.4103/2230-8210.176357

[4] Forhan M, Gill SV. Obesity, functional mobility and quality of life. *Best Pract Res Clinical Endocrinol Metabol*. 2013;27(2):129–137. https://doi.org/10.1016/j.beem.2013.01.003

[5] Mayoclinic. Obesity. https://www.mayoclinic.org/diseases-conditions/ obesity/diagnosis-treatment/drc-20375749. Accessed March 2024.

[6] Anderson DA, Wadden TA. Treating the obese patient: suggestions for primary care practice. *Arch Family Med*. 1999;8(2):156–167.

[7] Gopalakrishnan S, Ganeshkumar P, Prakash M, Amalraj V. Prevalence of overweight/obesity among the medical students, Malaysia. *Med J Malaysia*. 2012;67(4):442–444.

[8] Jakicic JM, Marcus BH, Gallagher KI, Napolitano M, Lang W. Effect of exercise duration and intensity on weight loss in overweight, sedentary women: a randomized trial. *JAMA*. 2003;290(10):1323–1330. https://doi.org/10.1001/jama.290.10.1323

[9] Mokdad AH, Ford ES, Bowman BA, et al. Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. *JAMA*. 2003;289(1):76–79. https://doi.org/10.1001/jama.289.1.76

[10] Gupta S, Ray TG, Saha I. Overweight, obesity and influence of stress on body weight among undergraduate medical students. *Ind J Commun Med*. 2009;34(3):255–257. https://doi.org/10.4103/0970-0218.55296

[11] Hingorjo MR, Syed S, Qureshi MA. Overweight and obesity in students of a dental college of Karachi: lifestyle influence and measurement by an appropriate anthropometric index. *J Pak Med Assoc*. 2009;59(8):528–532.

[12] Nicklas BJ, Wang X, You T, et al. Effect of exercise intensity on abdominal fat loss during calorie restriction in overweight and obese postmenopausal women: a randomized, controlled trial. *Am J Clinic Nutr*. 2009;89(4):1043–1052. https://doi.org/10.3945/ajcn.2008.26938

[13] Yousif MM, Kaddam LA, Humeda HS. Correlation between physical activity, eating behavior and obesity among Sudanese medical students Sudan. *BMC Nutr*. 2019;5(1):e6. https://doi.org/10.1186/s40795-019-0271-1

[14] Mahmood S, Perveen T, Najjad M, Yousuf N, Ahmed F, Ali N. Overweight and obesity among medical students of public sectors institutes in Karachi. *Pak J Obes Wt Loss Ther*. 2013;3:e157. https://doi.org/10.4172/2165-7904.1000157

[15] Kumar HH, Mohanan P, Kotian S, Sajjan B, Kumar S. Prevalence of overweight and obesity among pre-school children in semi urban South India. *Ind Pedr*. 2008;45(6):497–499.

[16] Boo N, Chia G, Wong L, Chew R, Chong W, Loo R. The prevalence of obesity among clinical students in a Malaysian medical school. *Singapore Med J*. 2010;51(2):e126.

[17] Vasudevan K, Umamaheswari K, Vedapriya D, Chinnakali P. Overweight and obesity in young adults: food for thought. *Int J Curr Res Rev*. 2012;4(24):38–42.

[18] Ercan S, Dallar YB, Önen S, Engiz Ö. Prevalence of obesity and associated risk factors among adolescents in Ankara, Turkey. *J Clinic Res Pediat Endocrinol*. 2012;4(4):204–207. https://doi.org/10.4274/Jcrpe.714