

# Central Obesity among University Students

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## ABSTRACT

**OBJECTIVE:** To analyze the prevalence of central Obesity among university students and distinguish its emergence between male and female students at Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro.

**METHODOLOGY:** A cross-sectional study was conducted at LUMHS from February to April 2025, including 114 university students from different programs (57 males and 57 females), who were selected through non-probability convenience sampling. Data on BMI, demographics, lifestyle factors, Physical factors, and family history of Obesity were collected using a structured questionnaire. The circumference of the waist was measured to estimate central Obesity using World Health Organization (WHO) cut-off values ( $\geq 94$  cm for males,  $\geq 80$  cm for females). Data were analyzed using SPSS version 25, and the Chi-square test was used to analyze gender differences in males and females, with  $p < 0.05$  considered statistically significant.

**RESULTS:** The study found that 40.4% of students had central Obesity. It was more common in females (49.1%) than in males (31.6%) ( $P=0.03$ ). Factors such as less physical activity, eating quickly often, and a family history of Obesity were linked to higher waist circumference.

**CONCLUSION:** Central Obesity is becoming a growing health issue among university students, especially among females who appear to be more at risk. Promoting healthy habits and raising awareness early can help lower the risk of future metabolic problems.

**KEYWORDS:** Central Obesity, Gender Differences, University Students, Waist Circumference, Body Mass Index, Metabolic Syndrome.

## INTRODUCTION

Central Obesity is defined as excessive fat buildup in the region of the abdomen. It is a major element of metabolic syndromes and can cause many cardiometabolic diseases such as hypertension, type 2 diabetes mellitus and also cardiovascular disorders<sup>1</sup>. Central Obesity differs from general Obesity in body mass index (BMI). Central Obesity, especially visceral fat accumulation, leads to greater metabolic consequences<sup>2</sup>. Waist circumference is recognized as the best indicator for assessing central Obesity and its related metabolic risks<sup>3</sup>.

In recent times, a sedentary lifestyle, reduced physical activity, and consumption of unhealthy food are major reasons for central Obesity in young adults and university students<sup>4</sup>. Central Obesity is especially alarming in this population as it increases the risk of early onset of metabolic syndrome and cardiovascular morbidity later in life. Gender plays an important role in fat distribution, because males tend to accumulate visceral fat, while females mostly develop subcutaneous fat; despite that, changing lifestyle patterns have blurred these distinctions<sup>5</sup>.

Despite information on general Obesity in developing

countries, data on central Obesity and its effects across genders remain limited. Therefore, the objective of this study is to determine the prevalence of central Obesity and to compare gender-specific patterns of fat accumulation among students of Liaquat University of Medical and Health Sciences, Jamshoro.

## METHODOLOGY

A descriptive cross-sectional study was conducted to determine the frequency of central Obesity among male and female university students. This study was conducted at Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro, Sindh, from February to April 2025, with ethical permission granted by the university authorities for voluntary participation to achieve maximum results.

The subject of the study included undergraduate students of both sexes enrolled at LUMHS belonging to different academic programs. The prevalence of the study is 40%,  $d=9\%$ , and a 95% confidence interval. 114 students were part of this study. These participants were selected according to non-probability convenience sampling, of their own will.

The participants of this study were male and female students aged 18-30 who provided informed consent. Those with known health issues such as metabolic, endocrine, or chronic systemic diseases (e.g., diabetes, thyroid disorders, and circulatory diseases), those on long-term steroid or hormonal therapy, and pregnant females were not part of this study. The questionnaire of this study was structured around

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demographic data (Age, gender, academic year) and lifestyle factors (dietary habits, physical activity, etc.). Central Obesity was defined per the WHO criteria<sup>6</sup>. Data on BMI, demographics, lifestyle factors, Physical factors, and family history of Obesity were collected using a structured questionnaire. The circumference of the waist was measured to estimate central Obesity using World Health Organisation (WHO) cut-off values ( $\geq 94$  cm for males,  $\geq 80$  cm for females). Data were analyzed using SPSS version 25, and the Chi-square test was used to examine gender differences in males and females, with  $p < 0.05$  considered statistically significant.

## RESULTS

Out of 114 university students, 57 (50%) were Male and 57 (50%) were Female. The average Age of students was  $21.8 \pm 2.1$  years. The mean waist circumference for males was  $88.5 \pm 9.4$  cm, while for females it was  $78.2 \pm 8.6$  cm. According to WHO cut-off values [6], 46 students (40.4%) were found to have central Obesity. Among them, 18 males (31.6%) and 28 females (49.1%) were centrally obese, showing that Obesity was more common in females ( $p = 0.03$ ). Overall, 36 students (31.6%) had an average BMI of  $\pm 3.8$  kg/m<sup>2</sup>, and 14 students (12.3%) were categorized as obese. Students with higher BMI were more likely to have central Obesity. Also, 72% of participants said they often eat fast food (more than 3 times a week), and 61% reported low physical activity. Both these factors were strongly linked with higher waist circumference ( $p < 0.05$ ). In addition, 42% of students with central Obesity said they have a family history of Obesity, which shows that genetics may also play a vital role, as shown in **Table I**.

## DISCUSSION

This study in Liaquat University of Medical and Health Sciences assessed the prevalence of central Obesity and gender differences among its students. The results showed that 40.4% of the university's students had central Obesity. Out of these 40.4% students, females had a higher prevalence (49.1%) than males (31.6%) ( $p = 0.03$ ). This shows a higher trend of central Obesity among females, similar to other international studies.

Central Obesity is an accumulation of fat in the abdominal area, particularly visceral fat. The portal blood system supplies the visceral fat. Accumulation

of excessive fat in this region may result in the spilling of fat deposits within the bloodstream and produce health-related issues. Some studies suggest that even individuals with regular BMI have cardiovascular problems because of central obesity<sup>7</sup>. The higher prevalence of central Obesity could be due to hormonal factors, reduced physical activity, or dietary factors. According to other research, females tend to accumulate more subcutaneous and visceral fat due to differences in fat metabolism secondary to estrogen hormone<sup>8</sup>.

Our study findings are also consistent with a study conducted in India, which showed that 42% of young women had central Obesity compared to 30% of their male counterparts, highlighting gender differences in fat distribution<sup>9</sup>.

Another study in Pakistan also showed that urban female students had a larger waist circumference and lower levels of physical activity than their male peers<sup>10</sup>. In our research findings, the main predictors of central Obesity were sedentary behaviors, high consumption of fast food, and low levels of physical activity, highlighting the relationship between lifestyle and central obesity<sup>11</sup>.

Additionally, 42% of the students with central Obesity also possessed a family history of Obesity, suggesting a potential genetic risk. This is in accordance with the findings of Qi et al.<sup>12</sup>, who reported that genetic risk also interacts with environment and behaviour, enhancing the risk of central Obesity even among younger people. The participants' average BMI was  $24.2$  kg/m<sup>2</sup>, and nearly a third were overweight, indicating that central fat may develop before Obesity is even noticeable, a trend observed in previous cohort studies<sup>13</sup>.

In terms of public health, these findings point to the need for earlier screening and preventive measures targeting central Obesity among young adults. Health education organizations should develop health promotion initiatives that provide dietary counselling, promote exercise, and inform people about the risks of Obesity. These efforts must be undertaken earlier because central Obesity at a young adult age can result in later life metabolic syndrome as well as cardiovascular diseases<sup>14</sup>.

The research reveals that central Obesity is prevalent among university students, with gender differences mirroring differential behaviours and physiological variations. Management of lifestyle factors with

**Table I: Demographic and Anthropometric Characteristics of Study Participants (n=114)**

Variable	Male (n=57)	Female (n=57)	Total (n=114)	p-value
Mean Age (years)	22.1 $\pm$ 2.3	21.5 $\pm$ 1.9	21.8 $\pm$ 2.1	0.28
Mean Waist Circumference (cm)	88.5 $\pm$ 9.4	78.2 $\pm$ 8.6	83.3 $\pm$ 10.1	0.00*
Central Obesity (Yes)	18(31.6%)	28(49.1%)	46(40.4%)	0.03*
Mean BMI (kg/m <sup>2</sup> )	24.5 $\pm$ 3.6	23.9 $\pm$ 3.9	24.2 $\pm$ 3.8	0.41
Overweight (BMI 25–29.9)	19(33.3%)	17(29.8%)	36(31.6%)	0.65
Obese (BMI $\geq$ 30)	7 (12.3%)	7 (12.3%)	14(12.3%)	1.00
Low Physical Activity	31(54.4%)	39(68.4%)	70(61.4%)	0.12
Fast-Food Intake (>3x/week)	38(66.7%)	44(77.2%)	82(71.9%)	0.19
Family History of Obesity (Yes)	20(35.1%)	28(49.1%)	48(42.1%)	0.14

\*Significant at  $p \leq 0.05$

structured health education can help significantly diminish long-term morbidities of cases of Obesity amongst young adults.

## CONCLUSION

This study shows that the buildup of belly fat is becoming a growing health problem, even in young adults, as many university students were found to have central Obesity. The results also showed that female students had a higher rate of central Obesity than male students, which might be due to differences in body fat distribution and hormones. A larger waist circumference and a higher body mass index were associated with a poor diet. For instance, eating unhealthy food mostly, lack of physical activity, and a family history of Obesity. These findings point to the need for early detection and prevention, especially by promoting regular exercise, healthy eating, and lifestyle improvement programs on university campuses. Managing these risk factors early can help prevent future health issues like heart disease, metabolic syndrome and type 2 diabetes.

**Ethical permission:** Liaquat University of Medical & Health Sciences, Jamshoro, Pakistan, ERC approval letter No. LUMHS/REC/-1159.

**Conflict of interest:** There is no conflict of interest between the authors.

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**Data Sharing Statement:** The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publicly.

## AUTHOR CONTRIBUTION

Ghoto S: Principal investigator with the idea of the study, collected data, performed data analysis, wrote the results, wrote the manuscript, and reviewed it.

Roshan S: Data collection, Data analysis, and helped in manuscript writing.

Memon R: Literature review, helped write the manuscript.

Kabir A: Wrote the discussion and review the article.

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