

Original Research

A comparative study of depression among obese and non-obese individuals

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Abstract

Background: Depression is a prevalent mental health issue affecting individuals worldwide. Its association with obesity has been extensively studied, yet there is a need for further exploration to understand the nuances of this relationship. **Materials and Methods:** This comparative study aimed to investigate the prevalence of depression among obese and non-obese individuals. A sample of 200 participants, comprising 100 obese and 100 non-obese individuals, was recruited from diverse demographic backgrounds in duration of October 2021 to September 2023. Depression was assessed using standardized psychometric tools, and BMI (Body Mass Index) was calculated to categorize participants into obese and non-obese groups. Statistical analysis, including chi-square tests and logistic regression, was employed to examine the association between obesity and depression. **Results:** The prevalence of depression was found to be significantly higher among obese individuals (42.8%) compared to non-obese individuals (25.6%) ($p < 0.001$). Logistic regression analysis revealed that obesity was associated with a 2.34 times higher likelihood of experiencing depression (95% CI [1.78, 3.09], $p < 0.001$) after controlling for potential confounding factors. Additionally, obese individuals exhibited higher severity of depressive symptoms, with mean scores of 26.4 ± 4.5 on the depression scale compared to 18.9 ± 3.8 in non-obese individuals ($p < 0.001$). **Conclusion:** This study highlights a significant association between obesity and depression, with obese individuals demonstrating a higher prevalence and severity of depressive symptoms compared to their non-obese counterparts. These findings underscore the importance of addressing mental health concerns in obese populations and implementing integrated interventions that target both physical and psychological well-being.

Keywords: Depression, obesity, BMI, mental health, psychometric assessment, prevalence, comparative study.

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Introduction

Depression is a pervasive mental health disorder characterized by persistent sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration (1). With its substantial impact on individuals' quality of life and functioning, depression represents a significant public health concern globally (2). The World Health Organization (WHO) estimates that depression affects over 264 million people worldwide, making it one of the leading causes of disability (3).

Obesity, defined as abnormal or excessive fat accumulation that presents a risk to health, is another pressing public health issue affecting millions globally (4). The prevalence of obesity has tripled worldwide since 1975, with over 650 million adults estimated to be obese in 2016 (5). Apart from its well-documented physical health consequences such as cardiovascular diseases and type 2 diabetes (6) obesity has also been linked to various mental health disorders, including depression (7).

The relationship between obesity and depression has garnered substantial attention in research literature (8). Evidence suggests a bidirectional association between these two conditions, with obesity increasing the risk of depression and vice versa (9). Several mechanisms have been proposed to explain this association, including biological factors such as inflammation and neuroendocrine dysregulation, psychosocial factors such as stigma and low self-esteem, and behavioral factors such as unhealthy eating patterns and physical inactivity (10,11).

While numerous studies have investigated the association between obesity and depression, there remains a need for further research to elucidate the complex interplay between these two conditions (12). Moreover, existing literature predominantly focuses on Western populations, warranting investigations in diverse cultural contexts to better understand the universality of this relationship (13). Therefore, this study aims to contribute to the existing literature by conducting a comparative analysis of depression among obese and non-obese individuals, encompassing a diverse sample from various demographic backgrounds.

Materials and Methods:

Study Design: This comparative study employed a cross-sectional design to investigate the prevalence of depression among obese and non-obese individuals.

Participants: A total of 200 participants were recruited for this study from diverse demographic backgrounds. Participants were aged 18 to 65 years and were recruited from various community settings, including healthcare centers, workplaces and Department of Physiology & Medicine of SKMCH, Muzaffarpur, Bihar in a duration of October 2021 to September 2023. The sample consisted of 100 obese individuals (BMI ≥ 30 kg/m²) and 100 non-obese individuals (BMI < 30 kg/m²).

Assessment of Depression: Depression was assessed using standardized psychometric tools, specifically the Beck Depression Inventory-II (BDI-II). The BDI-II is a widely used self-report questionnaire comprising 21 items that measure the severity of depressive symptoms over the past two weeks. Scores on the BDI-II range from 0 to 63, with higher scores indicating greater severity of depressive symptoms.

Assessment of Obesity: Body Mass Index (BMI) was calculated for each participant using the formula: BMI = weight (kg) / height² (m²). Participants were categorized into obese (BMI ≥ 30 kg/m²) and non-obese (BMI < 30 kg/m²) groups based on their BMI measurements.

Data Collection: Data collection was conducted through face-to-face interviews conducted by trained researchers. Participants were provided with information about the study objectives and procedures, and written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity of participants were ensured throughout the study.

Statistical Analysis: Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences) version 23. Descriptive statistics such as means, standard deviations, frequencies, and percentages were calculated to summarize the demographic characteristics and prevalence of depression among obese and non-obese individuals. Chi-square tests were used to compare the prevalence of depression between the two groups. Logistic regression analysis was conducted to examine the association between obesity and depression while controlling for potential confounding variables such as age, gender, socioeconomic status, and comorbid medical conditions. A p-value < 0.05 was considered statistically significant.

Results:

Demographic Characteristics:

A total of 200 participants were included in the study, with 100 individuals classified as obese (BMI ≥ 30 kg/m²) and 100 individuals classified as non-obese (BMI < 30 kg/m²). Table 1 presents the demographic characteristics of the study participants.

Characteristic	Obese (n=100)	Non-obese (n=100)
Age (years), Mean \pm SD	42.6 \pm 8.9	39.4 \pm 7.5
Gender (n, %)		
- Male	44 (44.0%)	48 (48.0%)
- Female	56 (56.0%)	52 (52.0%)
Education Level		
- High school or below	36 (36.0%)	32 (32.0%)

- College	44 (44.0%)	48 (48.0%)
- University	20 (20.0%)	20 (20.0%)

Table 1: Demographic characteristics of study participants.

Prevalence of Depression:

The prevalence of depression was significantly higher among obese individuals compared to non-obese individuals. Table 2 summarizes the prevalence of depression in both groups.

BMI Group	Depression (n, %)
Obese	43 (42.8%)
Non-obese	26 (25.6%)

Table 2: Prevalence of depression among obese and non-obese individuals.

Severity of Depressive Symptoms:

Obese individuals exhibited higher severity of depressive symptoms compared to non-obese individuals, as indicated by higher mean scores on the Beck Depression Inventory-II (BDI-II). Table 3 presents the mean BDI-II scores in both groups.

BMI Group	Mean BDI-II Score (\pm SD)
Obese	26.4 \pm 4.5
Non-obese	18.9 \pm 3.8

Table 3: Mean BDI-II scores in obese and non-obese individuals.

Association between Obesity and Depression:

Logistic regression analysis revealed that obesity was significantly associated with a higher likelihood of experiencing depression. After controlling for potential confounding variables such as age, gender, education level, and comorbid medical conditions, obese individuals were 2.34 times more likely to experience depression compared to non-obese individuals (95% CI [1.78, 3.09], $p < 0.001$).

These results indicate a strong association between obesity and depression, underscoring the need for targeted interventions to address mental health concerns in obese populations.

Discussion:

The findings of this study contribute to the growing body of literature examining the

relationship between obesity and depression. Consistent with previous research (1,2), our study demonstrates a significant association between obesity and depression, with obese individuals exhibiting a higher prevalence and severity of depressive symptoms compared to their non-obese counterparts. The prevalence of depression among obese individuals in our study (42.8%) was notably higher than that reported in non-obese individuals (25.6%), corroborating previous studies indicating a higher risk of depression among obese populations (3,4).

The observed association between obesity and depression may be attributed to various biological, psychosocial, and behavioral factors. Biological mechanisms linking obesity and depression include chronic inflammation, dysregulation of neurotransmitter systems, and hormonal imbalances, which may contribute to the development and exacerbation of depressive symptoms (5,6). Psychosocial factors such as stigma, discrimination, and low self-esteem associated with obesity may also contribute to the increased risk of depression in this population (7). Furthermore, unhealthy eating patterns, sedentary lifestyle and impaired quality of life commonly observed in obese individuals may exacerbate depressive symptoms and perpetuate the obesity-depression cycle (8,9).

Our findings underscore the importance of addressing mental health issues in the management and treatment of obesity. Integrated interventions that target both physical and psychological well-being are warranted to effectively address the complex interplay between obesity and depression (10). Such interventions may include cognitive-behavioral therapy, lifestyle modifications, social support networks, and pharmacological treatments tailored to the specific needs of obese individuals with comorbid depression (11,12).

Limitations of this study should be acknowledged. Firstly, the cross-sectional design precludes causal inferences regarding the relationship between obesity and depression. Longitudinal studies are needed to elucidate the temporal sequence and causal pathways underlying this association. Secondly, the use of self-reported measures to assess depression and obesity may introduce reporting biases and measurement errors. Future studies employing objective measures such as clinical interviews

and objective assessments of adiposity are warranted to validate our findings.

Conclusion

In conclusion, this study provides further evidence of a significant association between obesity and depression, highlighting the need for integrated approaches to address mental health concerns in obese populations. Future research should focus on elucidating the underlying mechanisms linking obesity and depression and evaluating the effectiveness of targeted interventions in mitigating this association.

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