

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

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Abstract

Background: Obesity and depression are two major public health problems among adults, which is on the rise globally. Obesity causes poor self-image, low self-esteem and social isolation, all known contributors to depression. Obese individuals find themselves ostracized, stereotyped and discriminated. Both are associated with numerous health problems like hypertension, coronary artery disease and increase mortality. Hence, this study was done to assess depression as both share a common risk factor. **Aim & Objective:** To study the incidence of depression in obese and non-obese individuals and compare it between male and female. **Materials and methods:** A cross sectional study were done after IEC approval, with written informed consent. Study included 60 individuals in the age group of 18-24 years. Among the study group, cases included 30 obese and controls included 30 age and sex matched normal healthy individuals. Hamilton depression scoring system questionnaire was used to assess the level of depression in both groups. Parameters were statistically analyzed using SPSS 21.0 version. **Results:** Significant association between depression and obesity in adolescent was noted. A positive correlation was observed between obesity and depression. **Conclusion:** There is significant association between obesity and depression in both male and female.

Key Words: body Mass Index (BMI), depression, obesity

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Introduction

Depression is a common, debilitating, and potentially lethal disorder. Over 300 million people in the world are estimated to live with depression among which 20 million is associated with obesity^{1,2}. The disorder is ranked by WHO as the single largest contributor to global disability. Most worryingly, adolescents with major depressive disorder are up to 30 times more likely to commit suicide³.

According to World Health Organization (WHO) estimations, one out of five adults worldwide will be obese by 2025. Worldwide obesity has doubled since 1980. In fact, more than 1.9 billion adults (39%) of 18 years and older were overweight and over 600 million (13%) of these were obese in 2014. 42 million children under the age of five

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were overweight or obese in 2014^{5,6}. Obesity causes poor self-image, low self-esteem and social isolation, all known contributors to depression. Obese individuals find themselves ostracized, stereotyped and discriminated. Obesity is a public health problem due to its associated morbidity and mortality⁹. It has been noted that both obesity and depression has major impact on Adolescent age group when compared to old age group.

Adolescent age group can be divided into 3 categories: Early adolescence- 10 to 14 years, Mid Adolescence- 15 to 17 years, Late adolescence-18 to 24 years⁷. This study is to measure the level of obesity using Body mass index in mid and late Adolescent age group, its association with depression, how it differs in males and females and explain the complications it can carry to the individual's quality of life, longevity and the significant cost of healthcare systems⁸.

Materials and Methods

A cross sectional study was done after Institutional Ethics Committee approval. After obtaining written informed Consent, Study was conducted on 60 Adolescent individuals in the age group of 18-24 years.

Persons with previous psychological illness and on medications were excluded from the study. Body Mass Index (BMI) was calculated. $BMI = \text{Weight(Kg)} / \text{Height}^2(\text{meter}^2)$. WHO classification of BMI is

BMI	CLASSIFICATION
<18.5	Underweight
18.5-24.9	Normal weight
25-29.9	Overweight
30-34.9	Class I Obesity
35-39.9	Class II Obesity
≥40	Class III Obesity

Among the study group, cases included 30 obese individuals whose Body Mass Index was between 30-40 and controls included 30 age and sex matched Non-Obese whose Body Mass Index was between 18-25.

Hamilton depression scoring system questionnaire was used to assess the level of depression in both groups. The National Institute for Health and Clinical Excellence (NIHCE) established the levels of depression as:

HAM-D SCORE	INTERPRETATION
0-7	No Depression
8-13	Mild Depression
14-18	Moderate Depression
19-22	Severe Depression
≥23	Very severe Depression

Statistical analysis

The data acquired were statistically analyzed by using Statistical Package for Social Sciences (SPSS) 21.0 version. Independent student 't' test was applied to find the significant differences between the two groups. The P value <0.05 was taken as significant and P value <0.01 was taken as highly significant.

Results

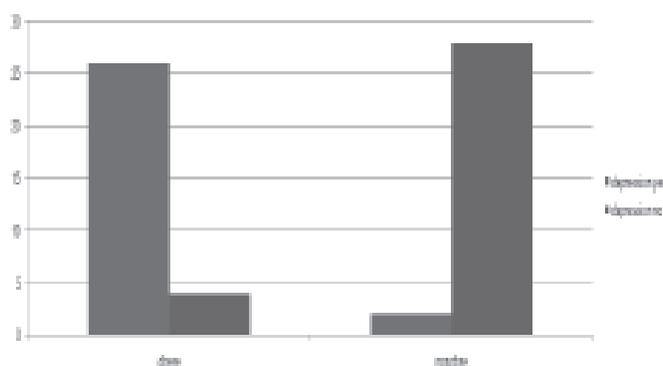
Of the total 60 individuals studied, 30 were Obese and 30 were non-Obese. As mentioned in table 1 The Mean BMI of the obese is 31.06 with Standard Deviation of 1.4 and The Mean BMI of the Non obese is 22.37 with Standard Deviation of 2 i.e BMI is significantly increased in obese individuals. It is also noted that The HAM-D score of the Obese females are significantly higher when compared to obese males. Table 1 gives the comparison of BMI and HAM-D score in Obese and Non-Obese males and Females

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	NONOBESE (MEAN±SD)	OBESE (MEAN±SD)	P-VALUE
BMI	22.37±2.0	31.06±1.4	0.004
HAM-D (males)	4.53±1.96	11.36±2.6	0.02
HAM-D (Females)	3.64±2.53	12.61±3	0.001

Table 1 :Comparison of BMI and HAM-D score in Obese and Non-Obese males and Females

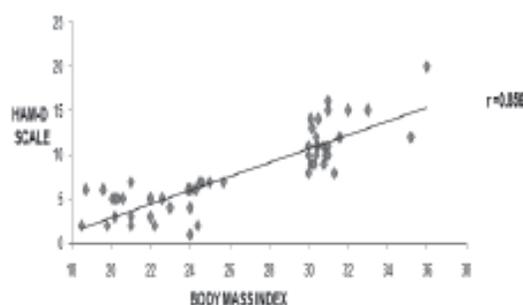
Figure 1 :Bar chart showing prevalence of obesity and depression



As shown in figure1 the blue bar represents depression which is more prevalent on obese individuals the Non obese individuals. Correlation between BMI and HAM-D score was done using

Pearson Correlation test. Correlation between BMI and HAM-D score as depicted in Figure2 shows a positive correlation. i.e as the BMI increase the HAM-D score also significantly increases.

Figure 2 :Correlationbetween BMI and HAM-D score



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Discussion

Depression and obesity are common conditions with major public health implications that tend to co-occur within individuals. In this study it is found that obese individuals are depressed when compared to non-obese individuals^{10,11}. There is also a positive correlation between depression and obesity i.e person with obesity has double the risk for depression and vice versa.

Milaneschi et al has demonstrated the relationship between these conditions is bidirectional: the presence of one increases the risk for developing the other². It has thus become crucial to gain a better understanding of the mechanisms responsible for the intertwined downward physiological spirals associated with both conditions^{13,14}.

The present review focuses specifically on shared biological pathways that may mechanistically explain the depression-obesity link, including genetics, alterations in systems involved in homeostatic adjustments (HPA axis, immuno-inflammatory activation, neuroendocrine regulators of energy metabolism including leptin and insulin, and microbiome) and brain circuitries integrating homeostatic and mood regulatory responses¹⁵.

Herva Et Al says the prevalence of depressive disorders appears to be on the increase, and age at onset to be successively declining⁴. In most cases, it is a question of a lifelong disorder with recurrent episodes, it has been estimated that it will occupy 20 per cent of the patient's remaining lifespan.

As a group, patients with depressive disorders are characterised by high mortality (even if suicide cases are excluded) on a par with the rates for cancer, diabetes and ischaemic heart disease^{8,9}. they often have somatic disorders, and are high consumers of pharmaceutical drugs of all categories. Modern classification systems with

well-defined criteria for the depressive disorders and new drugs have facilitated treatment.

Von Knorring Et Al conducted an informational media campaign regarding this association between obesity and depression directed towards the general public¹³. Multi professional conferences on specific aspects of depression and obesity can be organized at National level. An extensive program of general practice education including consensus conferences and statements, recognition and management guidelines, training videotapes, and publications can be done.

Public attitudes were found to be favorable, except attitudes toward antidepressants, which were viewed as addictive. Aspects of the campaign can be evaluated, including public attitude change, impact of educational materials on general practitioners, and prescription of antidepressants¹⁶. A campaign of this kind serves as a useful tool in enhancing public education and awareness and improving professional recognition and management of depression as Major depressive disorder (MDD) is a chronic, recurrent, and severe psychiatric disorder with high mortality and medical comorbidities.

Conway Et All found that Stress-related pathways have been directly involved in the pathophysiology and treatment. Aspects such as depression subtypes, inflammation, insulin resistance, oxidative stress, and prothrombotic states in critical brain circuits and periphery are critically appraised¹⁵. Finally, new strategies for approaching treatment-resistant major depression and potential adverse effects associated with this complex and intricate network are highlighted.

Torpey Et Al says that Researchers and developers are adapting the existing technology such as Artificial Intelligence phones or some wearable gadgets for controlling obesity⁸. They include the promotion of healthy eating culture and adopting the physically activity lifestyle.

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Limitations

Larger sample size should be done especially in defining prevalence in females and males. HAM-D alone cannot diagnose depression in a person further analysis of person is required. Furthermore, comprehensive characterization and targeting of the biological links between depression and obesity can be done.

Conclusion

From our study we conclude that there is significant association between Obesity and Depression. By early diagnosis and intervention, we can significantly reduce the amount of other comorbid conditions.

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Conflict of interest: Nil

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