Original Research Article

Clinical study of depression in obese individuals at a tertiary health care center

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Abstract

Background: Although the physical comorbidity burden in obesity is well established, its relation to mental health is relatively less explored. However, recently evidence is gradually accumulating on the association between various psychiatric disorders and obesity, particularly among those seeking treatment for the same. In present article we aimed to study, depression in obese individuals attending OPD at a tertiary health care center. **Material and Methods:** Present study was cross-sectional questionnaire-based study, conducted among persons attending OPDs with BMI ≥25 kg/m^2 (overweight and obese individuals). Patient Health Questionnaire (PHQ-9) was used to assess the Depressive symptoms. **Results:** In present study 200 individuals BMI ≥25 kg/m^2 were studied. Most of patients were from 31-45 years (41 %) age group. Prevalence of depression in present study was 19 %. Most of depression cases were from 46-60 years age group. In study subjects, hypothyroidism (14.5 %), diabetes (11.5 %) and hypertension (10.5 %) were most common pre-pregnancy medical disorders noted. In present study, Patient Health Questionnaire (PHQ-9) was used to assess the depressive symptoms. prevalence of depression was 19 %. We noted level of depression as minimal, mild, moderate, and severe (based on PHQ-9 scoring) in 9.5 %, 5.5 % 3 % and 1 % students respectively. Depressive symptoms were common among subjects with BMI > 35 kg/m^2. In present study 19 subjects had BMI > 40 kg/m^2 and out of those 9 had depression, which was statistically significant ($p<0.001$) In present study, depression was seen common in female subjects as compared to males and difference was statistically significant ($p<0.05$). Statistically significant difference was noted in cases with nuclear type of family, not living with family, perceived relationship with friends as not good, no regular physical activity, no sleeping satisfaction and less than normal sleeping hours. We did not noticed any significant difference in depression cases with regards to cigarette smoking, alcohol consumption and socioeconomic status and difference was not statistically significant ($p>0.05$). **Conclusion:** We observed an association between obesity and depression in moderate and severely obese individuals. Depression-related disability, compounded by lack of access to care, impacts on social and physical health.
Keywords: depression. obesity, social health, overweight.

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INTRODUCTION

Obesity, now an epidemic of global proportions is creating major health problems worldwide. India, with its rapid urbanization and changing socioeconomic landscape, is experiencing an increase in obesity rates among its population.[1] Although it is documented that obesity contributes to a variety of physical illness, such as hypertension, coronary heart disease and diabetes mellitus, much less is known about the possible links of obesity to mental disorders. Factors responsible for high BMI are poor dietary habits, improvement in standards of living, decrease in physical activities and dietary changes might

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be responsible for the higher frequency of obesity in Indian population. Although the physical comorbidity burden in obesity is well established,[2] its relation to mental health is relatively less explored. However, recently evidence is gradually accumulating on the association between various psychiatric disorders and obesity, particularly among those seeking treatment for the same.[3] Prevalence estimates of depression in India have varied widely depending on the assessment tools used and the community's sociodemographic profile.[4] Extreme obesity is related to increase risk for depression across gender and racial groups, even after controlling for chronic physical disease, familial depression and demographic risk factors.[5] In present article we aimed to study, depression in obese individuals attending OPD at a tertiary health care center

MATERIAL AND METHODS

Present study was cross-sectional questionnaire-based study, conducted among persons attending OPDs of tertiary hospital. Study was conducted under department of psychiatry, at Belagavi institute of medical sciences, Belagavi, Karnataka, India. Study duration was of 1 year from May 2020 to April 2021. Present study approval was obtained from local institutional ethical committee.

Inclusion criteria: Patients of 18- 60 years, with BMI ≥25 kg/m^2 (overweight and obese individuals) attending general OPD.

Exclusion criteria: Patients below 18 years and above 60 years. Patients not willing to participate.

Initially a pilot test was conducted among 20 obese individuals to confirm the reliability of the questionnaire, then 150 obese individuals were studied. A self-report questionnaire comprising written informed consent, questions regarding socio-demographic and lifestyle-related information, as well as psychometric scales to assess depression were used to collect the data.

Data included age, gender, monthly family income, lifestyle-related information contains questions concerning regular physical activity, sleeping satisfaction, number of sleeping hours per night, cigarette smoking, clinical history regarding any illness. Anthropometric measurements were taken as weight of patients noted to the nearest kilogram and height noted to the nearest centimeter and BMI was calculated. World Health Organization definitions applied to categories overweight (25–29.9 kg/m2) and obese (>30 kg/m2).[6] Patient Health Questionnaire (PHQ-9) was used to assess the Depressive symptoms. It is scored on a 27-point scale. Depressive symptoms were graded according to the following scores: (0-4) – no depression, score (5–9) – mild depression, score (10–19) – moderate depression and score (> 20) – severe symptoms of depression.[7] Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Frequency, percentage, means and standard deviations (SD) was calculated for the continuous variables, while ratios and proportions were calculated for the categorical variables. Difference of proportions between qualitative variables were tested using chi- square test or Fisher exact test as applicable. P value less than 0.5 was considered as statistically significant.

RESULTS

In present study 200 individuals BMI ≥25 kg/m^2 were studied. Most of patients were from 31-45 years (41 %) age group. Prevalence of depression in present study was 19 %. Most of depression cases were from 46-60 years age group. In study subjects, hypothyroidism (14.5 %), diabetes (11.5 %) and hypertension (10.5 %) were most common pre-pregnancy medical disorders noted.

Table 1: Age and Pre-existing Medical Disorders

Characteristics	No. of subjects (n=200) (%)	No. of subjects with depression (n=38) (%)
Age group (years)		
19-30	49 (24.5 %)	10 (5 %)
31-45	82 (41 %)	12 (6 %)
46-60	69 (34.5 %)	16 (8 %)
Pre-existing Medical Disorders		
Hypothyroidism	48 (24 %)	29 (14.5 %)
Diabetes	69 (34.5 %)	23 (11.5 %)
Hypertension	89 (44.5 %)	21 (10.5 %)
Heart disease	22 (11 %)	9 (4.5 %)
Asthma	14 (7 %)	8 (4 %)
Epilepsy	8 (4 %)	3 (1.5 %)

In present study, Patient Health Questionnaire (PHQ-9) was used to assess the depressive symptoms. prevalence of depression was 19 %. We noted level of depression as minimal, mild, moderate, and severe (based on PHQ-9 scoring) in 9.5 %, 5.5 % 3 % and 1 % students respectively. Depressive symptoms were common among subjects with BMI > 35 kg/m^2. In present study 19 subjects had BMI > 40 kg/m^2 and out of those 9 had depression, which was statistically significant ($p<0.001$).

Table 2: Distribution according to BMI and levels of severity of depression

BMI (kg/m²)	Subjects assessed	Subjects with depression				
		Mild (PHQ score 0-4)	Moderate (PHQ score 5-9)	Severe (PHQ score 10-19)	Very severe (PHQ score 20-27)	Total
25.1-30	71 (35.5 %)	3 (1.5 %)	2 (1 %)	0	0	5 (2.5 %)
30-34.9	66 (33 %)	5 (2.5 %)	3 (1.5 %)	2 (1 %)	0	10 (5 %)
35-39.9	59 (29.5 %)	7 (3.5 %)	4 (2 %)	2 (1 %)	1 (0.5 %)	14 (7 %)
≥ 40	19 (9.5 %)	4 (2 %)	2 (1 %)	2 (1 %)	1 (0.5 %)	9 (4.5 %)
Total	**200**	**19 (9.5 %)**	**11 (5.5 %)**	**6 (3 %)**	**2 (1 %)**	**38 (19 %)**

In present study, depression was seen common in female subjects as compared to males and difference was statistically significant ($p<0.05$).

Table 3: Distribution according to gender and levels of severity of depression

Gender	Subjects assessed	Subjects with depression				
		Mild (PHQ score 0-4)	Moderate (PHQ score 5-9)	Severe (PHQ score 10-19)	Very severe (PHQ score 20-27)	Total
Male	94 (47 %)	8 (4 %)	4 (2 %)	2 (1 %)	0	14 (7 %)
Female	106 (53 %)	11 (5.5 %)	7 (3.5 %)	4 (2 %)	2 (1 %)	24 (12 %)
Total	**200**	**19 (9.5 %)**	**11 (5.5 %)**	**6 (3 %)**	**2 (1 %)**	**38 (19 %)**

Statistically significant difference was noted in cases with nuclear type of family, not living with family, perceived relationship with friends as not good, no regular physical activity, no sleeping satisfaction and less than normal sleeping hours. We did not noticed any significant difference in depression cases with regards to cigarette smoking, alcohol consumption and socioeconomic status and difference was not statistically significant ($p>0.05$).

Table 4: General characteristics

General characteristics	No. of subjects (n=200) (%)	No. of subjects with depression (n=38) (%)	P value
Cigarette smoker (>1 pack/day)			0.054
Yes	51 (25.5 %)	23 (11.5 %)	
No	149 (74.5 %)	15 (7.5 %)	
Alcohol consumption (>30 grams/day)			0.634
Yes	41 (20.5 %)	27 (13.5 %)	
No	159 (79.5 %)	11 (5.5 %)	
Socioeconomic status			0.24
Upper middle	119 (59.5 %)	24 (12 %)	
Lower middle	43 (22.5 %)	10 (5 %)	
Upper lower	38 (19 %)	4 (2 %)	
Type of family			< .001
Nuclear	152 (76 %)	30 (15 %)	
Joint	48 (24 %)	8 (4 %)	
Living with family			0.035
Yes	166 (83 %)	13 (6.5 %)	
No	34 (17 %)	25 (12.5 %)	
Perceived relationship with friends			< .001
Good	144 (72 %)	6 (3 %)	
Not good	56 (28 %)	34 (17 %)	
Regular physical activity			< .001
Yes	13 (25.5 %)	0	
No	187 (25.5 %)	38 (19 %)	
Sleeping satisfaction			< .001
Yes	138 (69 %)	2 (1 %)	
No	62 (31 %)	36 (18 %)	
Sleeping status			< .001
Less than normal	39 (25.5 %)	27 (25.5 %)	
Normal (7–8 hours)	118 (59 %)	6 (3 %)	
More than normal	43 (25.5 %)	5 (25.5 %)	

DISCUSSION

India is being ambushed by urbanization, junk food and sedentary lifestyles; with one in every five Indians being obese.[8] Compared with the general population, people with obesity tends to face chronic conditions, such as diabetes and heart disease, are twice as likely to experience mental health comorbidities, such as depression.[9] Also depressed patients tend to have adverse health behaviors, such as alcohol consumption, cigarette smoking, poor diet, and may have a sedentary lifestyle. Onset of depression in adolescence doubles the danger of obesity in comparison with those who do not suffer depression. Adolescent depression due to obesity is more seen in women. Some studies even report that existence of depression in adolescence increases the individual's potential for developing obesity in older age.[10] Maximal evidence existed for the association between depression and obesity with longitudinal studies demonstrating a bidirectional link between the two conditions. The odds ratios (ORs) were similar for developing depression in obesity (OR: 1.21–5.8) and vice versa (OR: 1.18–3.76) with a stronger association observed in women.[11] de Wit *et al.*[12] conducted a meta-analysis of community based studies in which the association between depression and obesity was examined in adults and showed a significant positive association between depression and obesity in the general population, especially among women. A growing body of evidence suggests that there may be pathophysiological links between psychiatric disorders such as schizophrenia and metabolic conditions such as obesity and diabetes.[13] Yousef M *et al.*,[14] conducted a meta-analysis to study relationship between depression and risk of metabolic syndrome (MetS). They noted that the odds of MetS was higher in depressed compared to non-depressed individuals. For cross-sectional studies, depressed patients in Europe (OR = 1.35; 95 %CI: 1.47–1.99) were at higher odds of MetS compared to those in America and Asia. For cohort studies, depressed patients in America (OR = 1.46; 95 %CI: 1.16– 1.84) were at higher odds of MetS than those in Europe. Cross-sectional studies indicated women with depression were at higher odds of MetS (OR = 1.95; 95 %CI: 1.38–2.74) compared to men. In both types of studies, the odds of MetS decreased with age. In a case control study, Koski M[15] noted that depression was more common in obese subjects than in controls. However, slight depression was most common in the study group and 7% of the subjects had masked depression. Regarding weight changes, the Beck Depression Inventory questions on both weight loss ($p = 0.014$) and weight gain ($p = 0.017$) were statistically significant. In the study group, individuals with BMI over 40 kg/m2 gained the most weight; however, weight loss was very low overall. Regarding changes in appetite, the majority of the study group responded that they had a poorer appetite than previously. In a review of association studies Psychiatric disorders and obesity, Rajan TM[16] maximal evidence existed for the association between depression and obesity with longitudinal studies demonstrating a bidirectional link between the two conditions. The odds ratios (ORs) were similar for developing depression in obesity (OR: 1.21–5.8) and vice versa (OR: 1.18–3.76) with a stronger association observed in women. Obesity and depression have a significant and bidirectional association. Gender appears to be an important mediator in these relationships. Gender as a significant moderator of the obesity-depression association was also observed in the meta-analysis by Blaine[17], with a significantly higher risk (150%) among females (OR: 2.5). Similar findings were noted in present study. People with obesity and depression appear to be a specific subgroup of depressed patients in which calorie-restricted diets might constitute a promising personalized treatment approach. The reduction of depressive symptoms may be related to immunoendocrine and psychosocial mechanisms.[18] Interestingly, Atlantis and Baker, in their systematic review of epidemiological studies aimed at determining whether obesity causes depression, have found weak evidence for obesity increasing incidence of depression and point out the need for methodologically rigorous prospective cohort studies in this regard.[19] Given the high prevalence of depression and the significant burden of the disease on the individual, health system, and society, adopting appropriate methods to identify risk factors, prevention, treatment, and management of this illness is a must.[20] Individuals with risk of mild depression to be treated with life style modification, dietary advice and involvement of pleasure seeking activities. Individuals with risk of moderate depression need to be referred to psychological councilor for further investigations and counselling sessions.[11]

Limitations of the present study was the reliance on self-report questionnaire for determination of depressive symptoms so we did not assess categories of depressive disorders diagnostically. Also confounding effects of unmeasured medical comorbidities and differences were not assessed.

CONCLUSION

Psychological consequences of obesity range from lowered self-esteem to clinical depression. We observed an association between obesity and depression in moderate and severely obese individuals. Depression-related disability, compounded by lack of access to care, impacts on social and physical health.

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