The Relationship Between Body Mass Index And Depression Among The Patients Attending A Tertiary Care Centre In Northern India

Haseeb Khan MD*, Anand Vishal MD, Dharmendra Uraiya MD***, Anoop Kumar MD****, Vimlesh Kumar Verma MD******

* Assistant Professor. Department of Psychiatry, Hind Institute of Medical Sciences. Safedabad, Barabanki, U.P. 225001, ** Assistant Professor, Department of Medicine, Dr Ram Manohar Lohia Pgimer And Hospital, New Delhi – 110001, ***Associate Professor, Department of Medicine, Hind Institute of Medical Sciences, Safedabad, Barabanki U.P. 225001, India

Abstracts: Introduction: Today, obesity and depression are two major illnesses that are on the rise all over the world and threaten human health. The prevalence of obesity in India was reported as 11.1% by WHO standards and 4.5% of total population in India are suffering from depression, at each moment of time. Objective: To determine the relationship between Body Mass Index (BMI) and depression among the patients attending department of psychiatry in a tertiary care centre. Methods: A cross-sectional study conducted among 50 patients attending the psychiatry department and diagnosed as Depression disorder, during April 2012 to December 2012. Body Mass Index (BMI) formula was used to assess obesity and Hamilton rating scale (HAM-D) was used to assess the severity of depression. Result: 19 (38%) study subjects were in the age group of 18yrs to 30 yrs with mean age as 34.2 ±14.57 years. 36(72%) were of normal weight or under-weight and14 (28%) were pre-obese. Among 14 pre-obese and obese study subjects, 2(15.4%) had mild, 4(18.2%) had moderate and 8(53.3%) had severe type of depression (p=0.03). Conclusion: There is a positive and significant relationship between BMI and the severity of depression among the patients attending department of psychiatry. [H Khan, Natl J Integr Res Med, 2018; 9(3):43-47]

Key Words: Obesity, BMI, Depression, Sociodemographic factors, Age, Gender.

Author for correspondence: Anand Vishal, Assistant Professor, Department Of Medicine, Dr Ram Manohar Lohia Pg imer And Hospital, New Delhi – 110001 E-Mail: dranandvishal21@gmail.com

Introduction: Around the world, obesity is a rising public health problem and depression is one of the most common mental disorders [1]. Depression is the leading causes of disability affecting about 121 million people globally.[2] It is causing huge burden of disease and enormous economic costs, worldwide[3]. The prevalence of obesity in India was reported as 11.1% by WHO standards[4]. At each moment of time, 4.5% of total population in India is suffering from depression. In the past 2-3 decades, among all community groups, the pervasiveness of overweight and obesity has constantly increased.[5] Obesity is a disease of indolence and results from a prototype of inactivity which is attributive of the automated life [6]. Obesity predicts the subsequent onset of depression, a mood disorder that affects the mental health.[7] Affecting the mental health in turn disturbs individual's social health, physical health, disruption in job performance, social and interpersonal relations [1].

Obese people are subjected to social rejection, discrimination and negative stereotyping and such experiences could lead to negative consequences in terms of selfimage, self-esteem and mood. There are several studies relating to the association of obesity and depression in which some approve [8–13] and others reject[14-15] the relationship. A few studies have been found that surveyed the relationship between obesity or Body Mass Index (BMI) and depression. Given the high prevalence of depression and the significant burden of the disease over the individual, health system, and society. [1,16–17]. Adopting appropriate methods to identify risk factors, prevention, treatment, and management of this illness is a must. Hence, the present study was conducted with the objectives to study the various socio-demographic variables among patients with depression and to study the relationship between their BMI and severity of depression.

Methods: This cross-sectional study was conducted from April 2012 to December 2012 at S.N. Medical college and Hospital, a tertiary care centre in Agra, Uttar Pradesh. The convenient sampling method used and 50 consecutive patients, attending the psychiatry O.P.D. and consenting to participate were included in the study.

The inclusion criterion being: - Patients in the age group of 18-55 years and diagnosed as Depression disorder. The exclusion criteria being: Subjects with history suggestive of manic, hypo manic or mixed episodes**,** with severe depression with psychosis, seizure disorders **,**other co-morbid psychiatric illness, co-morbid major medical illness**,** history of head injury**,** history of psychiatric medication in prior 3

months, substance abuse except nicotine and caffeine, history of ECT in prior 3 months, pregnant and lactating women. Data was collected taking interview of the patients. The study tool used was a predesigned and pretested structured questionnaire. The questionnaire include two parts; First part consist of : socio demographic profile including, age , sex, education, income per month, residence, religion, marital status, family history of depression. Height and weight was measured for calculating BMI. The second part of the questionnaire include the questions from Hamilton rating scale for depression (HAM-D).[18]. The HAM-D clinician-administered depression assessment scale, originally was developed by Max Hamilton. Internal consistency measured by Cronbach's was ± 0.74. High sensitivity and NPV at the cut-off score of 8/9(sensitivity 0.93, specificity 0.98, NPV 1.0) show the screening properties, and high specificity and PPV at cut-offs 9/10, the diagnostic properties of the instrument. The area under the ROC curve (AUC=0.746) indicates the concurrent validity of the HAMD-17 score with the ICD-10criteria for depressive disorder. Although the HAM-D questionnaire list 24 items, scoring is based on the first 21 items. Eight items are scored on five points scales, ranging from 0(=not present) to 4(=severe). Nine items are scored from 0 to 2. It provides a simple way of assessing the severity of depression, higher the score, more severe is the depression. Total HAM-D score and severity of depression are correlated as follows: 0-7 = normal, 8-13=mild depression, 14-18=moderate depression, 19-22=severe depression,>23=very severe depression. After taking approval from the institutional ethic committee, the data was collected. The participation of study subjects was on voluntarily basis, written informed consent obtained from those who were willing to participate.

Statistical Test: The data was entered in Microsoft excel 2007.All the continuous variable was summarized using mean & SD while the categorical variables as percentage & proportion. For showing the association student t test was applied on continuous variables while chi-square test was applied for categorical variables. The significance considered when the p value is less than 0.05.

Result: Total 50 patients were studied. Table no 1 shows sociodemographic wise distribution of study subjects, which shows that 19 (38%) study subjects fall in age group between 18yrs to 30 yrs and 2 (4%) were in the age group of 51yrs to 60yrs. Mean age of subject was 34.2 ±14.57. Maximum, 34(68%) were female and 16 (32%) were male. Most of the study subjects, 27 (54%) were studied upto intermediate, 9 (18%) were illiterate and only 3 (6%) were professional. Maximum, 36 (72%) were Hindu, rest were Muslims. 29 (58%) of the study subjects were from urban area. 14 (28%) of study subjects had positive family history of mood disorders. Table no.2 shows that 23 (68%) of female and 9 (57%) of male study subjects were married. Remaining 11(32%) female and 7(43%) male study subjects were unmarried. None of the study subjects were divorced or separated.

Table 1: Sociodemographic wise distribution of study subjects

Sr. No	Socio-demographic variable	Study subjects (N= 50)	Percentage (%)
1	Age group		
	18-30	19	38
	31-40	15	30
	41-50	14	28
	51-60	2	4
	Mean age (mean±sd)	34.2±14.57	
2	Gender		
	Male	16	32
	Female	34	68
3	Education		
	Illiterate	9	18
	Middle class	8	16
	High class	9	18
	Intermediate class	10	20
	Graduation	7	14
	Post graduation	4	8
	Professional	3	6
4	Religion		
	Hindu	36	72
	Muslim	14	28
5	Residence		
	Rural	21	42
	Urban	29	58
6	Family h/o mood disorder		
	Present	14	28
	Absent	36	72

Table 2: Marital status wise distribution of study subjects

Marital status	Female		Male	
	No.	(%)	No.	(%)
Unmarried	11	32	7	43
Married	23	68	9	57
Divorced	0	0	0	0
Separated	0	0	0	0
Total	34	100	16	100

Table 3: Distribution of subjects according to severity of depression on Ham-d score and their relation with body mass index (BMI)

BMI	Depression					
	Mild		Moderate		Severe	
	No.	%	No.	%	No.	%
Normal weight	11	84.6	18	81.8	7	46.7
Pre-obese and obese	2	15.4	4	18.2	8	53.3

* Chi-square= 6.89, df=2, p=0.03

Fig. No.1. Severity of depression wise distribution of subjects

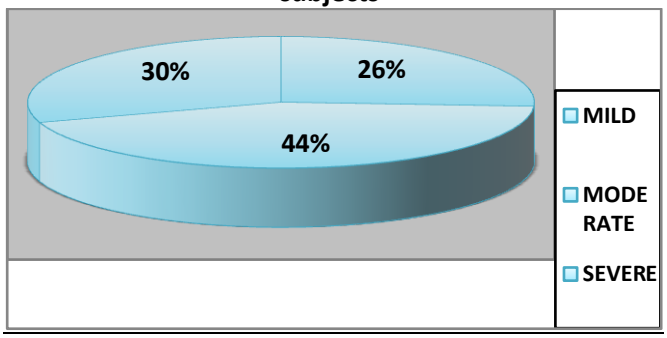

Figure no.1 shows that 13(26 %) of study subjects had mild depression as per HAM-D score, 22 (44 %) of study subjects had moderate degree of depression and 15 (30%) had severe degree of depression as per HAM-D score. Table no.3 shows that, 36(72%) were of normal weight or under-weight and14 (28%) were pre-obese. Among 14 pre-obese and obese study subjects, 2(15.4%) had mild, 4(18.2%) had moderate and 8(53.3%) had severe type of depression (p=0.03).

Discussion: The results showed that there is a positive and significant relationship between BMI and depression among the patients attending psychiatry department of a tertiary care centre which is similar as that of Markowitz et al [19] who conducted a review of the literature for understanding the relation between obesity and depression. In his review cross-sectional studies, longitudinal studies, and the evidence based on intervention studies suggest that obesity is associated with depressive symptoms. The longitudinal studies suggest that obesity can lead to later depression and intervention studies suggest that weight loss treatment improves mood, but this improvement may not be result of actual weight loss. Our results are consistent with those of other studies [8-10,12-13,19-21] and suggest that there is a significant relationship between obesity and the degree of depression. De Wit et al. 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[2]. Keddie findings showed an association between obesity and depression in severely obese women. But, adjusting for number of chronic conditions, self-rated health status and demographic variables weakened this association[8]. Luppino et al. in a systematic review and meta-analysis of longitudinal studies demonstrated a reciprocal association between depression and obesity. They found that baseline obesity can increase depression and this association is more robust for depressive disorder than for depressive symptoms and for Americans than for Europeans [10]. Dong et al. suggested that extreme obesity is related to the increased risk for depression across gender and racial groups, even after controlling for chronic physical disease, familial depression, and demographic risk factors[9]. Arterburn et al. suggested strong relationships between depression, obesity, and disability [12]. Our results differ from those of Askari et al. that showed that obesity does not lead to depression[14]. This inconsistency may be due to different sampling. Also, the findings of the current study seem to be inconsistent with those of Roberts et al.'s study that found no independent association between major depression and body weight in adolescents from the community. They suggested components of body image as an etiologic link between major depression and body weight among adolescents[15]. The association between obesity and depression may be affected by socio demographic factors or other conditions. Moderator factors, such as severity of depression, severity of obesity, gender, specify individuals and conditions where depression occurs.[22]

Conclusion: There is a positive and significant relationship between BMI and depression. The severity of depression increases with increase in obesity grading. The association between obesity and depression affected by socio demographic factors like severity of obesity, gender, education status. It is unaffected by family history of mood disorder.

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