



ORIGINAL RESEARCH PAPER

Physiology

ASSOCIATION OF BMI WITH ANXIETY LEVEL IN MEDICAL STUDENTS

KEY WORDS: Obesity; Anxiety; Medical Students; Zung Self Rating Anxiety Scale

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ABSTRACT

Background: Obesity is associated with conditions like hypertension, coronary arteriosclerosis, elevated cholesterol, type 2 diabetes, stroke and certain types of cancers. Psychologically it is associated with several problems such as lower self-concept, negative self-evaluation, decreased self-image, anxiety and depression.

Aims & Objective: To find the association between anxiety and obesity in medical students.

Materials and methods: A cross sectional study of one hundred eight 1st year medical students of Nalanda Medical College, Patna was conducted. They were screened for body mass index. The students were divided into three groups according to WHO technical series 854 recommended cut off values. The students were assessed with Zung self rating anxiety scale. The anxiety scores were quantified into normal (20-44), mild to moderate (45-59), moderate to severe (60-74), extreme severe (75-80). The overweight and anxiety scores were compared by Casper X2 test, gender differences and anxiety scores were compared with X2 With Yates Correction.

Results: Among students with BMI cut off value <50th percentile, 22 (97%) and 1 (3%) had normal and mild anxiety score respectively. Students with BMI cut off value 50th-85th percentile, 52 (89.9%) had normal and 7 (10.1%) had mild anxiety scores. The students with BMI cut off value >85th percentile, 24 (93.9%) and 2 (6.1%) had normal and abnormal anxiety scores respectively. Majority of male students [94.3% (n= 50)] and female [91.6% (n=76)] showed normal anxiety scores.

Conclusion: In this study, there was no association between overweight and anxiety scores. The gender did not appear to be related to anxiety scores.

INTRODUCTION

The connection between obesity and depression is an important public health issue because both of these conditions are so common and have a significant impact on our health care systems. Some patients who are overweight may be prone to anxiety because of societal attitudes towards obesity. Also, while anxiety can lead to decreased appetite and weight loss in some individuals, others eat more and gain weight. The rapidly changing social, political and economical scenario in the world has not left Indian family untouched. The anxiety and stress associated with achievement failure, lack of confidence etc are likely to lead to depression, anger, violence and other mental health problems. Since the medical students are future health professionals we need to focus on identification and management of anxiety.

Overweight and obesity are major public health problems and the most common nutritional disorder. Both overall and abdominal obesity are associated with non communicable chronic diseases such as type 2 diabetes, cardiovascular, cerebrovascular, psychological diseases and cancer. The prevalence of obesity is expected to rise with urbanization and as lifestyle shift towards reduced physical activity.[1] Experts warn that diabetes and heart disease could rise dramatically in the next 25 years unless it is tackled. This could overwhelm India's already over burdened health care system.[2] Anxiety disorders are the most prevalent mental disorders in developed countries. Obesity is hypothesized to be a risk factor for anxiety disorders but evidence supporting an association between these two conditions is not clear.[3] Depression, anxiety or somatoform disorders might be related to overweight and obesity. Concomitant to the psychiatric disorder, there is stress that could cause an increase in appetite and therefore, weight gain. Metabolic processes that can add to obesity could be highly pronounced in these patients.[4,5] Metabolic changes are influenced by the stress system. They include a high cortisol excretion, which might play a role in the relationship of stress and depressive disorders. Brain processes in response to stress and the hypothalamic-pituitary adrenal axis could explain increase in BMI.[5]

Hence our main objective was to determine the relationship between Obesity and Anxiety Level amongst Medical Students.

MATERIALS AND METHODS

All 1st year medical and dental students were screened for height and weight and then BMI was calculated using the formula Weight in Kg/ Height in m² (Quetelet index). Further these students were classified based on WHO Technical series 584 recommended cut off values for the adolescents.[6] It is as follows:

- a) <50th percentile – underweight
- b) 50th-85th percentile- Normal
- c) >85th percentile- At risk of Overweight

The study was conducted two months after the admission to the course so that students settle down in the new place and they have adequate time to face forthcoming examinations. The students were given and a self prepared proforma containing a set of questions about the diet, familial history of diabetes, HTN, Medications. And baseline heart rate and BP was measured. Based on these data the students were selected for the study.

Inclusion Criteria

All healthy 1st year Medical & Dental students within the age group of 17-22 years

Exclusion Criteria

- a) Students on long term drug therapy
- b) History of endocrinal disorders
- c) Among 120 students, 12 students did not give consent and

hence excluded from study Later students were given Zung self rating anxiety questionnaire and they were allowed to complete the questionnaire in 10 minutes duration. The anxiety scores were quantified into normal (20-44), mild to moderate anxiety (45-59), moderate to severe anxiety (60-74), extreme severe anxiety (75-80).

Statistical Analysis

The obesity and anxiety scores were analyzed by odds ratio

analysis, gender differences and anxiety scores were compared with X2With Yates Correction. $p < 0.05$ was considered as significant.

RESULTS

Total 108 students including 65 male and 43 female students participated in this study. Out of total 108 students, 92.6% (n=100) had normal and only 7.4% (n=8) had abnormal anxiety scores. None of the students had anxiety score more than 62(moderate to severe anxiety). The odds ratio analysis was used to analyze the data of anxiety scores and BMI. The BMI < 50th percentile was taken as reference and odds ratio value in cut off value range 50th – 85th percentile and >85th percentile was 1.07 & 0.37 respectively suggesting that there is no significant association between nutritional status and anxiety. (Table 4)

Table-1: Characteristics of Boys and Girls

	Age	Height	Weight	BMI	Anxiety Score
Boys	20.1±0.82	167.5±6.79	68.2±12.32	23.5±3.89	33.1±7.61
Girls	18.9±0.92	157.4±5.95	54.7±11.71	24±4.41	34.3±7.91

Table-2: BMI Cut-off Values in Male and Female Student

Sex	Mild to Moderate Anxiety Scores(≥45)	Normal Anxiety Scores (22-44)	Total
Male	7(10.76%)	58(89.23%)	65
Female	4(8.4%)	39(91.6%)	43
Total	11(17.4%)	97(92.6%)	108

Table-3: Anxiety Scores in Male and Female Students

Cut-off values	Male students	Female students	Total
<50th percentile	20 (32.1%)	8(20%)	28(24.1%)
50-85 percentile	27 (41.5%)	26 (57.1%)	53(51.1%)
>85th percentile	17 (26.4%)	10 (23.8%)	27(24.8%)

Table-4: Anxiety Scores in Different BMI Cut-off Values

BMI Cut-off Values	Mild to Normal AnxietyScore	Moderate Anxiety Score	Total
<50th percentile	1 (3%)	22(97%)	23
50th – 85th percentile	7 (10.1%)	52(89.9%)	59
>85th percentile	2 (6.1%)	24(93.9%)	26

Table-5: Anxiety Scores in Different BMI Cut-off Values of Male Students

Cut-off values	Normal Anxiety Scores	Mild to Moderate AnxietyScores	Total
<50 th percentile	17 (100%)	1	18
50 th – 85 th percentile	22 (90.9%)	2 (9.09%)	24
>85 th percentile	13 (85.7%)	3(14.28%)	16

Table-6: Anxiety Scores in Different BMI Cut-off Values of Female Students

Cut-off values	Normal Anxiety Scores	Mild to Moderate Anxiety Scores	Total
<50thpercentile	14 (93.75%)	1 (6.25%)	15
50th – 85th percentile	47(89.58%)	5 (10.41%)	52
>85th percentile	19(95%)	4(5%)	23

DISCUSSION

In the present study there was no association between obesity and anxiety in medical students. This finding is consistent with a study which reports that depression, anxiety or somatoform disorders do not seem to be related to overweight. [7] Obesity and depression are each complex multifactorial conditions that often have roots in childhood and are influenced by genetics as well as family, social, and environmental context. [8] Separation anxiety and social phobia appeared to be more frequent in obese children and adolescents. [9] This observation converges with the classical portrayal of obese children as being excessively dependent on their family

environment as displaying excessive attachment to parental figures associated with separation anxiety and fear of criticism and as avoiding social contact, all of which confine them to familiar surroundings. Present study did not show gender changes of anxiety scores in obesity. Previous studies have evaluated that females would be more vulnerable to psychological consequences of obesity may not be surprising, given the relatively greater social pressure and importance to self-concept thinness for girls and women in western society. [11] Adolescent females at any weight tend to have greater body dissatisfaction and to rate their body image lower than do adolescent males. [12] Adolescent obesity may increase the risk for subsequent Major depressive disorder or anxiety disorders, but these psychological consequences seem to be limited to females with very high relative weights in adolescence. [13] Sarah et al in his study conducted at New York concluded that anxiety disorders and depression were associated with a higher BMI in females, whereas these disorders in males were not associated with a higher BMI. [14] The anxiety or depression is associated with a number of unhealthy behaviors like smoking, obesity, sedentary lifestyle, binge drinking and heavy alcohol consumption. [15]

The psychological stress like anxiety which activates HPA axis increases cortisol secretion, which in turn inhibit lipolysis and increases fat deposition resulting in obesity. The early adulthood an important developmental period because it represents a life stage during which concerns about appearance is central. Obese individuals are more likely to be teased, to have higher levels of body dissatisfaction, [16] and to diet [17] negative self-appraisal and psychological symptoms.

The previous study [18] said that obese children and adolescents might experience significant restrictions in their emotional well-being. Psychological problems suggested to be associated with obesity included negative self-esteem, increased anxiety and depression levels. The limitations of our study were Small sample size and there might be ethnic and demographic variables. Self-assessment anxiety scale used might not give the appropriate data because subjects tend to respond in socially desirable way.

The future scope is (1) Anxiety and motor performance using NCV to assess the affection levels and at the same time assessment of serum cortisol. (2) Autonomic function tests to be don serially to see whether increased stress hormones alter the function in long run as compared to their baselines

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