

PREVALENCE OF PSYCHOPSYCHIATRIC AILMENTS WITHIN OBESE FEMALE MEDICAL STUDENTS OF SOUTH PUNJAB

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ABSTRACT

OBJECTIVE: To evaluate the prevalence of depression and anxiety within non-obese & obese female medical students of South Punjab and to observe their academic performance in context of pass percentage.

METHODOLOGY: One hundred and six female medical students; fifty-three obese ($BMI > 24.9 + WHR \geq 0.8$) and fifty-three non-obese ($BMI \leq 24.9 + WHR < 0.8$) were selected from Nishtar Medical University, Multan, through convenience sampling and were assessed by AKUADS, BDI & BAI for prevalence of depression and anxiety respectively. To observe their academic performance, acquisition of a pass percentage within last professional exam was considered as an indicator to define academic performance in satisfactory terms.

RESULTS: Within the Obese Female Population, 81.1% had depression, and only 18.9% were normal, according to the AKUADS. While interpreting depression on BDI, 79.2% of the obese subjects presented with depression, while 20.8% showed no signs of depression. Moreover, on BAI, 77.4% of the obese females presented with anxiety, while only 22.6% of them were normal. The percentages of depression and anxiety among non-obese females were 22.6%, 26.4% and 20.8% on AKUADS, BDI and BAI respectively. As for academic performance, 79.2% of the obese females showed low academic scores; at the same time, only 20.8% of this population secured high academic scores. 66% of the non-obese subjects performed well academically. **CONCLUSION:** Obese females have high prevalence of psychopsychiatric ailments and perform less satisfactorily on academic front.

KEYWORDS: Depression, Anxiety, Female, Medical Students, Obesity, Academic Scores

INTRODUCTION

Depression and anxiety are two of the most common psychiatric ailments worldwide, especially among the young population. Depression is described as 'a feeling of persistent sadness and a

lack of interest or pleasure in previously rewarding or enjoyable activities' ¹ while anxiety is defined as 'a feeling of uneasiness and undue concern to a situation that is only subjectively seen as menacing'². These disorders are triggered by many biological, psychological and social factors,

most importantly obesity³. Obesity is a medical condition described as excessive deposition of adipose tissues in the body that affects physical and psychological health. Among the many indices used to evaluate obesity, the most popular ones are Body Mass Index (BMI) and Waist Hip Ratio (WHR)⁴. It has been inferred from contemporary studies that there exists an interrelationship between physical and mental health⁵. Increased adiposity leads to a wide range of pathogenesis which ultimately affect the psychiatric well-being of an individual in a negative fashion.⁶ Among women, elevated values of BMI and WHR are responsible for deranging the endocrine environment, most importantly the pathway that mediates serum estrogen levels⁷. The normal physiological effect of estrogen is mood elevation via increased levels of the neurotransmitters like serotonin and betaendorphins⁸. Both these neurotransmitters are directly associated with emotional well-being and positivity. In obese females, there is a declined expression of the estrogen receptor alpha gene in adipose tissue⁹, which consequently reduces the direct effects of estrogen on mood-elevating neurotransmitters¹⁰. Also, certain abnormal endocrine conditions such as Polycystic Ovarian Syndrome (PCOS), associated with metabolic disturbances, lead to psychopsychiatric disorders¹¹.

These coexisting psychiatric disorders in obese females are bound to adversely affect the everyday activities. In our study, we have evaluated the consequences of these disorders on academic performance of female medical students¹². Certain inventories and questionnaires have been developed over time to assess the degree of mood disturbances, such as the Aga

Khan University Anxiety and Depression Scale (AKUADS), Beck's Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) which we have used for our study. The record of last professional exam (in percentages) has been taken as the index of academic performance.

Hence, our study shall determine the prevalence of obesity among female medical students, along with the prevalence of depression and anxiety in these particular students.

MATERIAL AND METHODS

Study design: It was an Observational cross-sectional study that was conducted to find out the association of the scores of obesity-induced depression and anxiety with academic performance in female medical students.

Setting: The study took place at Nishtar Medical University, Multan.

Study Duration: This study was performed during the 2nd week of July, 2022.

Sample size: 106 female medical students from all five years of MBBS were selected and the sample size was calculated through the following equation derived from WHO Geneva issued software "Sample size determination in health studies – a practical manual, version 2.0.21":

$$n = \frac{\sigma^2 (Z_{1-\alpha/2} + Z_{1-\beta})^2}{(\mu_0 - \mu_1)^2}$$

The above-mentioned values have been calculated from BMI differences projected for various depressed groups by the work of Sander C and associates¹³.

SAMPLING TECHNIQUE:

The data was collected through convenience sampling. BMI and WHR of female medical students were measured randomly from all five years and 106 female medical students having matched age and ethnicity (between 18 and 23 years of age) were selected. The study population was divided into 2 equal groups. Group A consisted of 53 Non-obese female subjects (controls, with a BMI ≤ 24.9¹⁴ and WHR < 0.8¹⁴ as per WHO 2008 cutoffs), while Group B was having 53 Obese female subjects (with a BMI > 24.9¹⁴ and WHR ≥ 0.81¹⁴ as per WHO 2008 cutoffs).

Students with a BMI>30 and/or WHR>0.94 (morbidly obese females¹⁴), with a family history of depression, past history of psychiatric illness and/or drug abuse were excluded.

Having included participants with similar educational circumstances, the dependence on other environmental factors contributing to the anxiety, depression, and academic performances of these participants had been eliminated. To measure the indices of depression and anxiety, AKUADS (having 25- items, 13 psychological and 12 somatic) questionnaire, being available in both Urdu and English was used. The Results were collected on Likert scale (0–4, based on the mood pattern of past 2 weeks). It has a Cronbach’s alpha value of 0.83¹⁵. Moreover, BDIII [a self-reporting questionnaire bring used worldwide is actually a modified form of its original version (1961) consisting of 21- items, each of which is ranked by subject between 0 and 3 as per severity of features that were experienced over the past 2 weeks. It has a Cronbach’s alpha value between 0.75¹⁶ and 0.9220, and BAI based on 4-point Likert scale consists of 21 items for assessment of anxiety defined as a disorder apart from the depressive ailment. Calculation and criteria for BAI are the same as that for BDI, with a range of 0–3 for the severity of features, and a Cronbach’s alpha value of 0.922 scales¹⁷. Moreover, students’ marks in the last professional exam, in percentages, were used as an index of their academic performance. Data was entered and frequencies of Depression, Anxiety & Academic scores were derived in SPSS Version 26. Then Chi-Square tests were applied for data analysis in qualitative terms.

A p-value of <0.05 was considered statistically significant.

RESULTS

Within Non-Obese subjects, as identified on AKUADS, 77.4% of females were devoid of the depressive spectrum, while 22.6% of females harbored a previously undiagnosed shade of

depression. Moreover, on BDI, 73.6% of females showed no signs and symptoms of depression; at the same time, 26.4% of females presented with depression. While interpreting BAI, 79.2% of females had no anxiety, while 20.8% of females depicted signs of anxiety. In addition, 66% female population showed high academic scores; however, 34% of females were not able to score that well academically, as shown in Figure 1.

Within the Obese population, 81.1% of the female subjects had depression, and only 18.9% of females were normal, according to the AKUADS. While interpreting depression on BDI, 79.2% of females presented with depression, while 20.8% of females showed no signs of depression. Moreover, on BAI, 77.4% of females presented with anxiety, while only 22.6% of females were normal. While interpreting academic performance, 79.2% of females showed low academic scores; at the same time, only 20.8% female population depicted high academic scores, as shown in Figure 1.

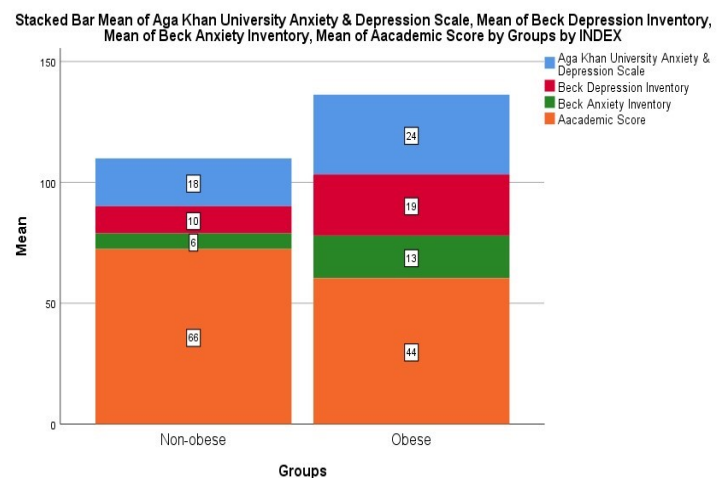


Figure 1: Graph depicting the scores of Depression, Anxiety and Academic Performance within Non-obese and Obese Groups

The results of Chi-Square Tests for AKUADS, BDI, BAI and Academic scores for Non-obese and Obese Groups have been displayed in Tables 1, 2, 3 & 4 respectively.

Table 1: Chi-Square Test Results for AKUADS scores in Non-obese and Obese Groups

Groups	Non-depressed	Having Depression/Anxiety	Total	Fischer's Exact Test Significance
Non-obese	41	12	53	
Obese	10	43	53	
Total	51	55	106	0.00

Table 2: Chi-Square Test for BDI scores in Non-obese and Obese Groups

Groups	Non-depressed	Depressed	Total	Fischer's Exact Test Significance
Non-obese	39	14	53	
Obese	11	42	53	
Total	50	56	106	0.00

Table 3: Chi-Square Test for BAI scores in Non-obese and Obese Groups

Groups	Not anxious	Anxious	Total	Fischer's Exact Test Significance
Non-obese	42	11	53	
Obese	12	41	53	
Total	54	52	106	0.00

Table 4: Chi-Square Test for Academic Scores in Non-obese and Obese Groups

Groups	Low Score	High Score	Total	Fischer's Exact Test Significance
Non-obese	18	35	53	
Obese	42	11	53	
Total	60	46	106	0.00

DISCUSSION

The current descriptive survey is one-of-its-kind for evaluating the burden of psychopsychiatric ailment as well as academic decline among medical students in the specific context of obesity. The study results showed that AKUADS, BDI & BAI scores of obese female medical students are higher than those of non-obese controls, demonstrating that obese female medical students are at greater risk of developing psycho-psychiatric ailments than their non-obese fellows, as indicated in contemporary studies¹⁸. Moreover, the former showed poor academic performance indicating that obesity-related depression induces several pathological changes which ultimately impair their cognitive capacities to perform their everyday life activities.

One of the postulated pathophysiological causes of this increased risk of depression and anxiety in obese females is their deranged estrogen levels¹⁹ which lower the levels of serotonin and beta-endorphins (mood-related neurotransmitters) within them. Studies have also reported that increased adiposity deranges the levels of leptin and leads to leptin resistance²⁰ which ultimately reduces the effects of leptin on NMDA (N-methyl D-aspartate) & AMPA(α -amino-3-hydroxy-5-methyl-4-isoxazole propionic acid) receptors associated the mood controlling pathways²¹

Research indicates that as the body fat percentage in females enhances, it negatively affects neuroendocrine²², hypothalamo-pituitary adrenal²³ and serotonergic axis²⁴, which becomes the basis of development of stress disorders (depression and anxiety), thus introducing a vicious circle of non-ending derangements of homeostatic pathways in obese females that compromises their mental capacity to perform well on academic grounds. Also, selfconsciousness about their body image lowers their self-esteem, which has an additive effect to their already disturbed mental health states.

In contemporary studies, the scores of depression and anxiety are overall found to be higher in medical students than in the general population²⁵, and the reason might be the greater than-normal expectations

of their parents and of society towards them. Moreover, the studies have proved that medical students are found to be more depressed than students from other fields such as fine arts or law²⁶ which can be attributed to a more demanding curriculum, the pressure of dealing with human lives, and the excessive practical work.

LIMITATIONS

Performing this survey at Nishtar Medical University Multan alone, however, could not eradicate the demographical bias. Moreover, the population chosen did not differ with respect to their age groups and, therefore, diminished the applicability and universality of the findings of this survey. In addition, there is a dire need for the development of a scientifically-accurate scale to determine the cognitive and intellectual abilities of the participants, as academic scores fail to provide a tangible measure for these.

CONCLUSIONS

Despite all these limitations, this research provides various factors that hamper the learning ability of medical students. This can help psychiatrists and health professionals realize the importance of obesity as a causative factor of poor performance on academic fronts. This study also raises awareness about various endocrine disorders, especially in the female population and medical students, which can help health professionals in identifying and dealing with them timely, and in a better way. This study urges the facilitators and parents to realize their responsibility of encouraging medical students to maintain good physical health, as a sound body has a sound mind. Moreover, it allows students to identify the causes of health problems within themselves.

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