Sarcouncil Journal of Medical Sciences

ISSN(Online): 2945-3526

Volume- 04| Issue- 03| 2025

Research Article **Received:** 01-02-2025 | **Accepted:** 22-02-2025 | **Published:** 21-03-2025

Body Mass Index And Its Association Across Different Psychiatric Illnesses In A Tertiary Care Hospital – A Retrospective Study

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Abstract: Psychiatric disorders and BMI disturbances both are major health concerns. Psychiatric disorders contribute to 7% of the global burden of diseases in all years lived with disability and on the other hand, BMI problems also add to great rates of comorbidities. In this study, we aim to explore the status of BMI with different psychiatric disorders. Aim: This study aimed to correlate Correlate BMI with psychiatric disorders Associated with Kretchmer personality type. Methods: A retrospective study was conducted on 105 participants between ages 18 – 60 years with psychiatric illnesses diagnosed as per DSM–5 criteria in a tertiary care hospital for 3 months. BMI was calculated using the Quetelet index, sample size was 105.Statistical analysis was done by SPSS software. Results: In this study 24% [n=25.2%] participants, indicating Asthenic personality type, seen in Schizophrenia, MDD. 52%[n=54.6%] participants, indicating Athletic personality type, seen commonly with Bipolar disorder,Schizophrenia,MDD, and AUD. 22%[n=23.1%]participants,had indicated Pyknic,an Athletic personality type seen commonly with bipolar disorder,Alcohol Use Disorder. 7% of participants, had obese BMI ranges, indicating Pyknic, Dysplastic personality types commonly seen with Bipolar disorder, MDD, schizophrenia. Conclusion: this study provided an overall picture of BMI status and association was found between personality type and psychiatric disorders which would help in early diagnosis and identification of persons who are prone to a particular psychiatric disorder. Conflicts of interest: none.

Keywords: BMI, Psychiatric disorders, Kretchmer's classification.

INTRODUCTION

Psychiatric illness and body mass index (BMI) problems with obesity are both major global health concerns and contribute to causes of mortality and morbidity worldwide (Mohammadi MR *et al.,* 2019). The existence and nature of a relationship between obesity and mental health in the general population have been less clear (Mohammadi MR *et al.,* 2019). Obesity can be estimated using Body Mass Index (BMI) which is a statistical index that uses a person's weight and height to provide an estimate of body fat in males and females of any age. It is calculated using a person's weight, in kilograms, divided by their height, in meters squared, or BMI = weight (in kg)/ height^2 (in m2). As per the BMI categories, individuals can be classified into underweight, normal weight, overweight, or obese as defined by the National Institute of Health (NIH) with ranges as follows.

Severely underweight - BMI less than 16.5kg/m^2
Underweight - BMI under 18.5 kg/m^2
Normal weight - BMI greater than or equal to 18.5 to 24.9 kg/m^2
Overweight – BMI greater than or equal to 25 to 29.9 kg/m^2
Obesity – BMI greater than or equal to 30 kg/m^2 (2)

There is less evidence clarifying the existence and nature of the association between mental health issues and varying ranges of BMI i.e. obesity. various factors such as Sex, age, and socio-economic status, physical activity, somatic illnesses, use of psychotropic medications have been hypothesized as potential moderators of the obesity-depression relationship (Weir, C. B., & Jan, A 2019). Body. Moreover, it is associated with various chronic physical diseases such as cardiovascular disease, various types of cancer, type 2 diabetes mellitus, and sleep apnea. The convincing evidence for a U-shaped association showing co-relation of an underweight individual with depression was given in a recent meta-

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DOI-https://doi.org/10.5281/zenodo.15065988

analysis (de Wit, L *et al.,* 2022). In some studies, the reported BMI was found to be increased due to mood disorders, while in some, it was found to be decreased due to mood disorders (Mohammadi MR *et al.,* 2019). There was found 27% increased risk of panic disorder among obese individuals as per a study showing an association between psychiatric disorders and obesity. Few other studies have shown the increasing trend in the comorbidity of eating disorders and obesity, as well as the increased risk of obesity in females with chronic alcohol use (Mohammadi MR *et al.,* 2019).

Body mass index (BMI) undergoes a substantial change in some psychiatric disorders (Mohammadi MR *et al.,* 2019). There is a great risk of increased mortality and morbidity between psychiatric illnesses and unhealthy BMI, since both conditions are highly prevalent, understanding their relationship is pivotal (Weir, C. B., & Jan, A 2019). Psychiatric disorders and BMI disturbances have great rates of co-morbidities, risk of development of cardiovascular diseases, and diabetes and hence play an important role in the treatment and prevention of pathology. They impose a considerable burden on the patient, their family Psychiatric disorders contribute 7% of the global burden of diseases as Disability-Adjusted Life Years and 19% of all years lived with disability (Mohammadi MR *et al.,* 2019). Hence, recognizing the varying ranges of BMI associated with certain psychiatric illnesses can prevent the risk as well as make interventions that can prevent mental health issues among them, which can lower the burden for the individual and lessen the economic cost for society (Weir, C. B., & Jan, A 2019). Body type theories, proposed by Kretschmer to correlate somatotypes and personalities or psychiatric disorders (Ikeda, M *et al.,* 2018). Using Kretchmer's observation of patients who classified people into four types. The 4 types he talked about included: (i) Pyknic type (ii)Asthenic type (iii)Athletic type (iv) Dysplastic type, we can understand the commonly seen psychiatric disorders among particular body types as per Kretchmer's classification of personality.

He used the physical constitution and temperament for this purpose. Pyknic Type – Such people are short in height with a heavily built body type. They have a short, thick neck. Temperament wise they exhibit characteristics of being social and cheerful. Kretschmer called them "cycloid" as they have a high probability of falling prey to the manic-depressive type of psychopathology.

Asthenic Type – Such persons are tall and thin with underdeveloped muscles. They are also underweighted. They are irritable and shirk away from responsibility. have the habit of daydreaming Temperament wise they are categorized as "schizoid" and may develop schizophrenia.

Athletic Type – These are muscular types that have well-built muscles and are neither tall nor short. They have a stable and calm nature and can adjust themselves to changes in the environment.

Dysplastic Type – This category includes people who do not exhibit any of the characteristics mentioned above but are a mix of all three types (egyankosh.ac.in).

Accordingly, Kretschmer classified four types of people: (a) the asthenic type who has a slender body ('leptosome') and is more prone to schizophrenia (SCZ); (b) the pyknic type who has a round body and is likely to become manic-depressive illness [bipolar disorder (BD)]; (c) the athletic type with a muscular body who may suffer from epilepsy; and (d) the dysplastic type (Ikeda, M *et al.,* 2018).

Using Kretchmer's observation of patients who classified people into four types. This study aimed to correlate BMI status and patients diagnosed with psychiatric illnesses. Understanding the status of BMI in patients with different psychiatric disorders is clinically important for managing the disease and its complications as well as understanding which personality type being more prone to developing psychiatric illnesses.

MATERIALS AND METHODS

Following approval from the Institutional Ethics Committee with reference number "NKPSIMS & RC and LMH/IEC / 6/ 2024 obtained on 25/01/2024,105 patients attending the Department of Psychiatry, In-Patient Department of a tertiary healthcare hospital were identified and recruited in the study after approval from institutional ethics committee providing informed consent by patients for participation in the study and publication of the scientific results without revealing their identity, name or initials, informed consent was taken and the patient is aware. DSM V criteria were utilized to establish a psychiatric assessment after taking an acceptable history. Factors such as diagnosis, age, sex, height, and weight were taken into account, and corresponding BMI values were correlated using Kretchmer's Classification of body types.

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The acquired data was collated and statistically analysed, and findings were obtained.

Population Under Study: Patients Diagnosed with psychiatric illness as per DSM-V

Study Site: NKPSIMS In-Patient Department of Psychiatry

Study Duration: 3 months

Sampling Technique: All consecutive patients who met the inclusion criteria

Inclusion criteria: Individuals aged 18-60 willing to participate and provide written informed consent.

Exclusion criteria: Patients with serious psychiatric illnesses were excluded.

This study was carried out to evaluate the association between BMI status and Psychiatric disorders.

The formula for sample size was calculated using mean BMI = 22.4 and Standard Deviation 5.22 in psychiatric disorder patients was 105.

For the observational retrospective study, BMI was calculated using the Quetelet index

BMI (kg/m2) = mass (kg) / height $(m)^2$.

The data was entered in Microsoft excel sheets, and analyzed by using appropriate statistical tests and SPSS software.

RESULTS

1) Formula for sample size was calculated using mean BMI = 22.4 and Standard Deviation 5.22 in psychiatric disorder patients was 105.
2) 60% of the participants in the study were males and 40% were females.

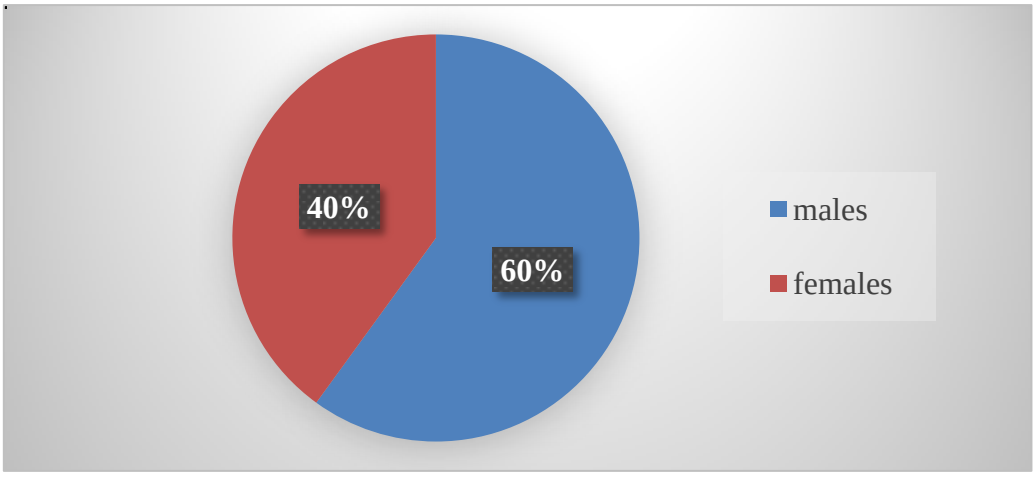

Figure no.1: Frequency of subjects as per sex

Frequency of major psychiatric illness i.e. schizophrenia in this study population 46%, AUD is 28% of patients, MDD is 15%, for bipolar disorder is 11%. N=105

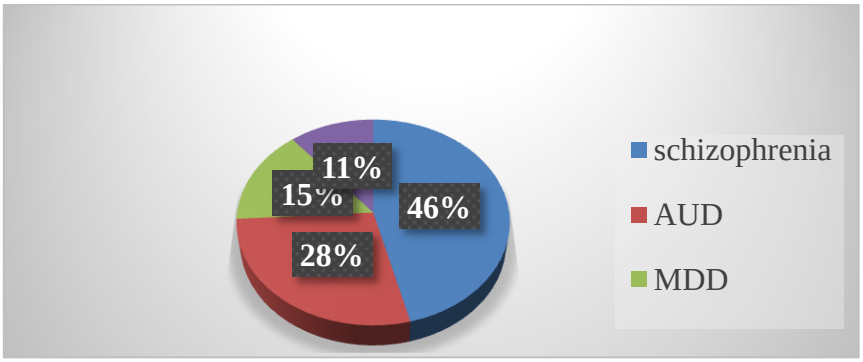

Figure no.2: Frequency of major psychiatric illnesses in this study (N=105)

In this study of 105 participants, the frequency of Kretchmer's personality types is found to be: athlete ic (36%), asthenic (30%), pyknic (22%), dysplastic (12%) personality types.

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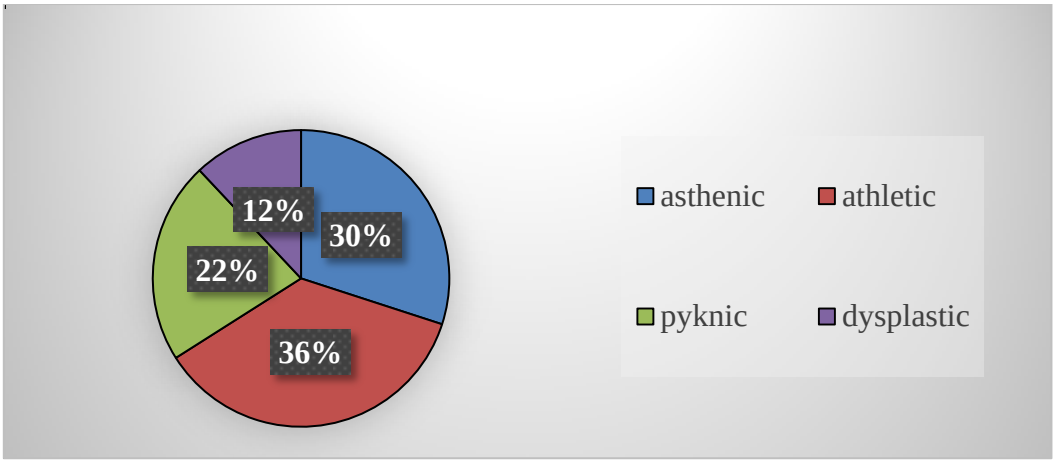

Figure no.3: Kretchmer's personality type in major psychiatric disorders

54% participants, having normal range BMI indicating Athletic personality type, seen commonly with Bipolar disorder, Schizophrenia, MDD and AUD

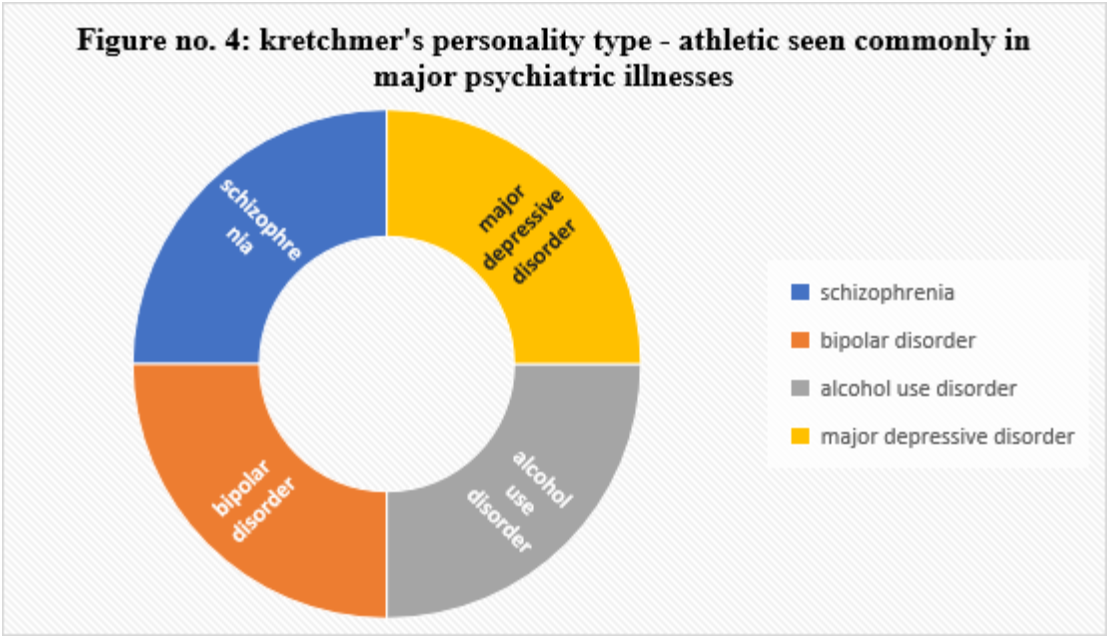

Figure no. 4: kretchmer's personality type – athletic seen comonly in major psychiatric illnesses

Out of 105 participants in the study, 32 were patients who were on long duration of antipsychotic medication and hence over the years, had shown metabolic side effects such as obesity.

DISCUSSION

There are specific Kretchmer's personality types seen more commonly in major psychiatric disorders. With the exception of athletic personality type found commonly in major psychiatric illnesses such as schizophrenia, major depressive disorder, bipolar disorder, alcohol use disorder. The information of Kretchmer's personality types can help clinicians in diagnostic formulations.

1. In our study, it was found that the majority of the number of subjects were females having varying ranges of BMI diagnosed with major psychiatric illness i.e. 60% of the subjects were females and remaining 40% were males. similar study by Mannan et al reported that individuals with mood disorders are 70% more prone to be obese there was bi-directional associations between depression and obesity, results showed a 70% increased risk of being obese in depressed individuals; conversely obese persons had a 40% greater risk of being depressed. The strength of association was found to be stronger for females compared with males. these findings are consistent with our study (Mannan, M *et al.*, 2016).

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2. In our study of 105 participants ,the prevalence of Kretchmer's personality type of asthenic category was found to be 30% and most prevalent psychiatric illness in the asthenic personality type as per Kretchmer's classification was that belonging to the diagnosis of schizophrenia .similar findings in the study of Masashi Ikeda1 et al showed The results of the correlation between low BMI and schizophrenia , which was measured or diagnosed by modern practice , provide support for the body type theories by Kretschmer (Ikeda, M *et al.*, 2018).
3. Another finding in our study was the prevalence of bipolar disorder was found maximally in the higher range group of BMIS included in the pyknic category as per Kretchmer's classification of personality types. These findings were similar to the study conducted by Mirko Manchia 2024 wherein stated that the prevalence of obesity is significantly higher (about 30%) among patients with bipolar disorder compared with healthy control subjects (Manchia, M 2024).
4. Individuals having lower as well as higher range BMI were found to be in athletic, asthenic, and pyknic personality types, these individuals had a diagnosis of major depressive disorder and some had alcohol use disorder. Similar findings by de Wit *et al.*, 2009; Jung *et al.*, 2017 found a U-shaped association between BMI and depression, with higher depression scores in underweight and obese patients (Kraus, C *et al.*, 2023). Weinland et al.7 observed that higher BMI predicts an increased risk of chronic alcohol consumption in male patients with AUD. They also found indications for the reverse association in female in-patients with AUD (Hoffmann, S *et al.*, 2023).

FINDINGS

as per Kretchmer's classification of personality type, in our study we could find that certain phenotypical as well as behavioural conditions grouped better after diagnosing with DSM 5, into particular disorders and correlation with body mass index. Such as the lean or lower BMI individuals corresponded best with the diagnosis of schizophrenia, followed by major depressive disorder the higher range of BMI fell into pyknic personality type, majorly diagnoses were manic-depressive illness. The athletic type included varying ranges of BMI including overweight and obese as well as normal weight, included all major psychiatric illness almost equally such as BPAD, SCZ, AUD.

Limitations:

The study's limitations include that it was done at a single hospital with a limited sample size, which may not reflect all persons with varying ranges of BMI and associated psychiatric illness or be generalizable.

Another disadvantage is that this study did not include participants under the age of 18 years and those patients who were previously on psychotropic medications.

CONCLUSION

Depending on the various ranges of BMI and associated psychiatric illness as such schizophrenia, bipolar disorder, major depressive disorder, alcohol use disorder, OCD etc. were studied based on Kretchmer's classification of personality types.

the prevalence of female subjects were more than males in our study. individuals with low ranges of BMI could be more prone to developing schizophrenia, major depressive disorder. On the other hand, those with high range of BMI could develop manic-depressive illness and could be more prone to chronic alcohol consumption.

Implications:

Healthcare professionals should actively screen patients based on physical parameters like height and weight as well as the psychosocial history obtained during history taking, so as to evaluate the risk of developing psychiatric illness with its association with Kretchmer's classification of personality to provide a holistic approach of health.

ACKNOWLEDGEMENTS

I am grateful to all my teachers for their invaluable guidance and support throughout the study. Their expertise and encouragement have been instrumental in its success. The manuscript has been read and approved by all the authors. All the requirements for the authorship mentioned have been met and the authors believe that the manuscript represents honest work.

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Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:
Bagde, R.S., Dhole, A.S., Kirpekar, V.C., Gawande, S.D., Tadke, R.R and Khare, A.A. "Body Mass Index And Its Association Across Different Psychiatric Illnesses In A Tertiary Care Hospital – A Retrospective Study." *Sarcouncil journal of Medical sciences* 4.3 (2025): pp 81-86.

Publisher: SARC Publisher