

THE EFFECT OF BIGOREXIA NERVOSA ON EATING HABITS: A STUDY ON UNDERGRADUATE MEDICAL STUDENTS IN SOUTH INDIA***¹Dr. Chitrula Sruthi, ²Dr. Abdul Gaffar, ³Dr. Mohammed Mubeen Fathima, ⁴Dr. Tulasi Priya Chennupati and ⁵Dr. B. Sai Kishore**^{1,2,4,5}MBBS, Nimra Institute of Medical Sciences, Jupudi, Andhra Pradesh, India.³MBBS, DPM, Nimra Institute of Medical Sciences, Jupudi, Andhra Pradesh, India.***Corresponding Author: Dr. Chitrula Sruthi**

MBBS, Nimra Institute of Medical Sciences, Jupudi, Andhra Pradesh, India.

Article Received on 19/11/2023

Article Revised on 09/12/2023

Article Accepted on 29/12/2023

ABSTRACT

Bigorexia nervosa also known as muscle dysmorphia is an upcoming disorder that is prevalent in youth. Muscle dysmorphia not only affects males but is also common among females. In this study we aim to understand MD in undergraduate medical students and its effect on eating habits. We also aim to compare MD and eating disorders in male and female population. This cross sectional study included a total of 404 undergraduate medical students from Nimra Institute of medical sciences, Vijayawada, South India. Participants who signed informed consent were asked to fill a questionnaire that included socio-demographic details, EAT 40 scale (40 item scale) and muscle dysmorphic disorder inventory (MDDI)- 13 item scale based on which they were assessed for bigorexia nervosa and eating disorders. Results showed that males had a higher mean EAT 40 score and MDDI score. But the difference is not substantial.

KEYWORDS: muscle dysmorphia, eating habits, medical students, bigorexia nervosa, psychiatry.**INTRODUCTION**

Health is not a mere absence of disease, all modern concepts of health imply that health is the maximum capacity of the individual for self-realization and self fulfillment. WHO defines that "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

Individual perceptions however differ from scientific definitions, and it is becoming apparent that they have significant consequences on the person's health behavior. It is found that gender and age influence people's perceptions of health as much as their background and environmental factors. But with the advent of digital society, there is more knowledge available for an average citizen. There is romanticizing of thin models among females and muscular body models among males, social media provokes such idolizing.^{[1][2]}

Muscle dysmorphia (MD) was initially described as reverse anorexia, given that the main symptoms are the belief of being too thin and not being muscular enough.^[3] Muscle dysmorphia (MD) was recently added to the fifth revision of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5, American Psychiatric Association, APA, 2013) as a specifier of body dysmorphic disorder (BDD). This specification is used

when 'the individual is preoccupied with the idea that his or her body build is too small or insufficiently muscular'.^[4] Muscle dysmorphia is also known as bigorexia nervosa.

There are no formal diagnostic criteria for MD, but the diagnosis is structured on the following three criteria (a) worry about the idea that their body did not have sufficient muscle, (b) the preoccupation causes clinically significant distress or impairment in social, occupational, or other areas of functioning, (c) individual's primary concern as well as their behavior could revolve around the idea of not being muscular enough.

Individuals with MD have delusions of reference, they believe that other people are mocking them for their appearance thus having the fear of being a part of social gatherings, which leads to social avoidance. Individuals with bigorexia are often in a depressed mood, have negative affectivity (neuroticism), they are sensitive to rejection, and seek perfectionism. They have a poor self image. Body dysmorphic disorder is also associated with elevated hostility and aggressive behavior. Its effects on eating habits are often overlooked.^{[4][5]}

MD is said to be more common in men mainly because of socio-cultural influence, but studies have proven that

MD may be more related to specific perceptions of pressure to attain an attractive body that is affecting at an individual level rather than global gender perceptions.^{[6][7]}

Medical students and future practitioners are at a high risk of eating disorders which are associated with high stress levels and body image dissatisfaction.^{[8][9]}

This study focuses on understanding the effects of MD on eating habits in both genders of undergraduate medical students.

MATERIALS AND METHODS

Study population: Undergraduate Medical students ranging from 1st MBBS to Internship in Nimra Medical college and Hospital, Vijayawada, south India, who are willing to participate in the study were asked to participate in the study.

Receiving the approval from the college ethical committee, a survey type cross sectional study was conducted that included quantitative type questions. Students were chosen randomly, those who had the odd roll numbers, to factor out any selection bias. Students who fit inclusion criteria were selected, those who matched exclusion criteria were eliminated. A total of 404 students participated in the study, with 216 male and 188 female students.

Inclusion criteria were.

1. Undergraduate students pursuing MBBS in Nimra Institute of Medical sciences and Research hospital.
2. Students within the age group of 17-24 years.

Exclusion criteria were.

1. Participants suffering from Anxiety, depression, OCD or other psychiatric disorders.
2. Participants currently on any psychiatric medication.
3. Participants suffering from chronic disorders.
4. Participants undergoing therapy or counseling.

Informed consent: All potential participant's parents were explained about the study in a simple yet detailed manner. If the parents desired to be a part of the study then his/her consent (signature) was recorded in the informed consent form.

Data collection tool

A pen and paper questionnaire was developed, that included questions on general description data such as age, height, weight, relationship status, year of medical college, geographical location etc. The questionnaire also included questions regarding the individual's psychiatric history, medical history and drug history.

The questionnaire was then divided into 2 parts. First part contained muscle dysmorphic disorder inventory to

assess the individuals' MD score. It is a 13 item, five item scale that is used to measure muscle dysmorphia symptoms. The questionnaire has three subscales: drive for size (DFS) (items 1, 3, 5, 6, 8), appearance intolerance (AI) (items 2, 4, 7, 9), and functional impairment (FI) (items 10, 11, 12, 13). The cut-off point is 39 (min 0 point, max 65 points), with higher scores reflecting high muscle dysmorphia symptoms.^[10]

The second part contained EAT 40 scale to understand eating habits of the participants. It is used to detect eating disorder symptoms in both sexes. EAT 26 is another available tool to detect eating disorders in individuals, but EAT-40 is preferred to analyze eating disorder symptomatology more in detail. The main score is calculated with a rating on a 5-point Likert-type scale. The cutoff point is 30, and >30 indicates having high pathology of an eating disorder.^{[11][12]}

Students who were willing to participate and those who fit the inclusion criteria were asked to fill the questionnaire, those who did not or those who matched exclusion criteria were excluded from the study.

Statistical Analysis

Categorical variables were expressed as number and mean number of students and compared across 2 groups using the t test. Continuous variables were expressed as mean compared across 2 groups using ANOVA for normal distribution, Kruskal Wallis one way ANOVA was used if the data did not follow the normal distribution. Statistical software SPSS V.23 was used for the analysis. An alpha level of 5% was taken as significant.

RESULTS

Participant characteristics: Table 1 shows socio-demographic details of the participants. The average age of the participants, both male and female is 20 years. Males had a slightly high BMI than compared to females. The average BMI was 23.7. All the males in the study population were single, while 4 females were married, rest of the females were single. Participants were included from all grades of medical college, the distribution shows no great significance.

Table 1: Descriptive Characteristics of The Participants of The Study.

Variables	Male (n=216)	Female (n=188)	Total (n=404)
Age in years (Mean)	20	20	20
BMI (Mean)	24.6	22.8	23.7
<u>Marital Status</u>			
Single	216	184	400
Married	0	4	4
Divorced	0	0	0
<u>Grade :</u>			
1 st MBBS	50	48	98
2 nd MBBS	64	56	120
3 rd MBBS	58	46	104
4 th MBBS	44	38	82

Comparison of students average scores on EAT-40 scale, Muscle dysmorphic disorder index (MDDI); Table 2 presents the average scores of EAT-40 and MDDI. In this study it is observed that Males had a slightly higher mean of EAT-40 scale, i.e 22.083. Males also had a

higher mean in MDDI scale i.e 21.59 while females had a mean of 17.98. It is noticed that males had a higher drive for size (one of the subscales), no significant difference was noted in appearance intolerance and functional impairment in between the two genders.

Table 2: Comparison of Students' Average Scores on EAT 40 Scale And Bigorexia (MDDI).

Variables	Males (Mean)	Females (Mean)	P value
EAT 40 SCALE	22.083	20.85	0.233
Normal Eating	0.837	0.835	0.001
Disrupted Eating	0.162	0.164	0.001
Bigorexia (MDDI)	21.59	17.98	0.001
Drive for Size	10.02	8.319	0.008
Appearance intolerance	4.805	4.393	0.164
Functional impairment	6.782	5.382	0.001

P value for disrupted eating was 0.001 and total MDDI scale score in was 0.001, hence both were declared significant.

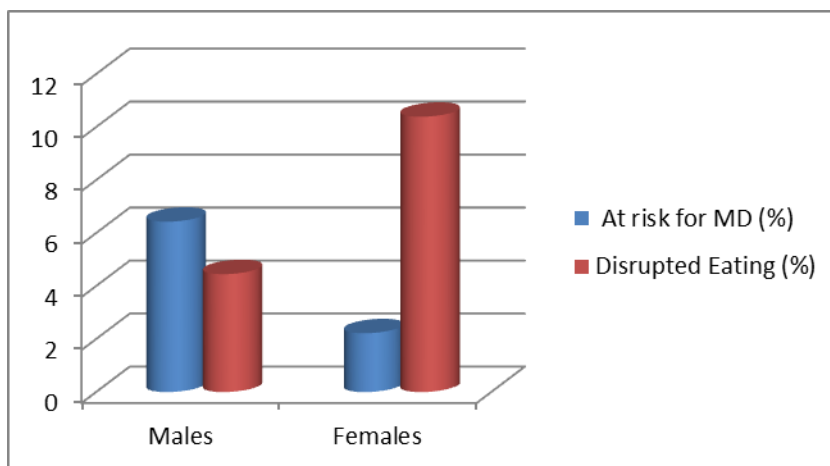


Figure 1: Clustered cylinder chart showing male and female population that are at risk for MD and those who have disrupted eating habits.

DISCUSSION

It is highly imperative to assess and evaluate to improve the eating habits and physical activity in young population in order to achieve the healthy society goal.

Our study aims in understanding a part of the problem with the youth. We tried evaluating the attitude of young students towards physical health, eating habits and their relationship with bigorexia nervosa.

In this study, most students had a normal BMI in terms of WHO classification. Male students had more BMI when compared to female students. A comprehensive study shows that the average BMI of undergraduate students is higher in males than females, indicating that the prevalence of obesity is higher in male students compared to female students.^[13] This can be explained by the fact that females in general are conscious of their physical appearance and hence are attentive to their dietary habits.

The MDDI scale used in this study supports that males had higher drive for size, and a higher overall MDDI score. Individuals with signs of muscle dysmorphia usually have normal looking appearance but they are of the opinion that their body size is very small, or that it is muscleless body structure.^[14] This feeling of inadequacy drives them to repetitive behaviors, mental actions as well as obsession with their muscle.

Most studies show that Muscle dysmorphia is a male dominant condition. In this study, it is seen that both males and females have a high risk of having symptoms of muscle dysmorphia, which is highly correlated with eating disorders.^[15]

In this study, we see that male students are prone to eating behavior disorders but it was also observed that student's eating attitudes did not differ according to their gender. This was also seen in a cross sectional study conducted among university students.^[16] There are studies that contradict our study results which show prove that young females exhibit eating restriction behavior due to bodyweight anxiety.^{[17][18]}

CONCLUSION

This study suggested that students with normal BMI are also at risk of developing muscle dysmorphia signs. This study supports the need to create health and education programs that can help students develop a positive body image and to encourage healthy eating habits. EAT-40, MDDI scales are useful in evaluating population based on their opinions, feelings and thoughts and hence are very subjective. In this regard, comprehensive studies supported by objective measurements on the effects of physical activity, eating habits, and other factors on body image in students are needed.

ACKNOWLEDGEMENTS

The staff and students of Nimra Institute of medical sciences for their kind cooperation throughout the study.

REFERENCES

- Svalastog AL, Donev D, Jahren Kristoffersen N, Gajović S. Concepts and definitions of health and health-related values in the knowledge landscapes of the digital society. *Croat Med J*, 2017 Dec 31; 58(6): 431-435. doi: 10.3325/cmj.2017.58.431. PMID: 29308835; PMCID: PMC5778676.
- Vittoria Franchina, Gianluca Lo Coco. The influence of social media use on body image concerns. *International journal of psychoanalysis and education*, 2018; vol.X, No.1. ISSN 2035-4630.
- Harrison G. Pope, Amanda J. Gruber, Precilla Choi, Roberto Olivardia, Katharine A. Phillips, *Muscle Dysmorphia: An Underrecognized Form of Body Dysmorphic Disorder*, *Psychosomatics*, 1997; 38(6): 548-557, 0033-3182.
- The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), is the 2013 update to the Diagnostic and Statistical Manual of Mental Disorders, the taxonomic and diagnostic tool published by the American Psychiatric Association (APA).
- Bo S, Zoccali R, Ponzio V, Soldati L, De Carli L, Benso A, Fea E, Rainoldi A, Durazzo M, Fassino S, Abbate-Daga G. University courses, eating problems and muscle dysmorphia: are there any associations? *J Transl Med*, 2014 Aug 7; 12: 221. doi: 10.1186/s12967-014-0221-2. PMID: 25095736; PMCID: PMC4256707.
- Amodeo AL, Esposito C, Antuoni S, Saracco G, Bacchini D. Muscle dysmorphia: what about transgender people? *Cult Health Sex*, 2020 Oct 8; 1-16. doi: 10.1080/13691058.2020.1814968. Epub ahead of print. PMID: 33030397.
- Tucker R, Watkins PL, Cardinal BJ. Muscle dysmorphia, gender role stress, and sociocultural influences: an exploratory study. *Res Q Exerc Sport*, 2011 Jun; 82(2): 310-9. doi: 10.1080/02701367.2011.10599759. PMID: 21699111.
- Iyer S, Shriram V. Prevalence of Eating Disorders and Its Associated Risk Factors in Students of a Medical College Hospital in South India. *Cureus*, 2021 Jan 26; 13(1): e12926. doi: 10.7759/cureus.12926. PMID: 33654608; PMCID: PMC7907547.
- Azzouzi N, Ahid S, Bragazzi NL, Berhili N, Aarab C, Aalouane R, Boujraf S, Rammouz I. Eating disorders among Moroccan medical students: cognition and behavior. *Psychol Res Behav Manag*, 2019 Mar 11; 12: 129-135. doi: 10.2147/PRBM.S165114. PMID: 30881156; PMCID: PMC6417001.
- Zeeck A, Welter V, Alatas H, Hildebrandt T, Lahmann C, Hartmann A. Muscle Dysmorphic Disorder Inventory (MDDI): Validation of a German version with a focus on gender. *PLoS One*, 2018 Nov 16; 13(11): e0207535. doi: 10.1371/journal.pone.0207535. PMID: 30444914; PMCID: PMC6239320.
- Garner DM, Olmsted MP, Bohr Y, Garfinkel PE. The eating attitudes test: psychometric features and clinical correlates. *Psychol Med*, 1982 Nov; 12(4): 871-8. doi:10.1017/s0033291700049163. PMID: 6961471.

12. Papini NM, Jung M, Cook A, Lopez NV, Ptomey LT, Herrmann SD, Kang M. Psychometric properties of the 26-item eating attitudes test (EAT-26): an application of rasch analysis. *J Eat Disord*, 2022 May 4; 10(1): 62. doi: 10.1186/s40337-022-00580-3. PMID: 35509106; PMCID: PMC9069796.
13. K. Peltzer, S. Pengpid, T. A. Samuels et al., "Prevalence of overweight/obesity and its associated factors among university students from 22 countries," *International Journal of Environmental Research and Public Health*, 2014; 11(7): 7425-7441.
14. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders, DSM-5*, Washington, DC, USA, 2013.
15. L. Badenes-Ribera, M. Rubio-Aparicio, J. Sánchez-Meca, M. A. Fabris, and C. Longobardi, "Association between muscle dysmorphia and eating disorder symptomatology: a systematic review and meta-analysis," *Journal of behavioral addictions*, 2019; 8(3): 351–371.
16. S. Öğür, A. Aksoy, and H. Selen, "Susceptibility of university students to eating behavior disorder: a case of Bitlis Eren University," *Bitlis Eren University Journal of Science*, 2016; 5(1): 14–26.
17. J. Kenardy, W. J. Brown, and E. Vogt, "Dieting and health in young Australian women," *European Eating Disorders Review*, 2001; 9(4): 242–254.
18. M. K. Serdula, E. Collins, D. F. Williamson, R. F. Anda, E. Pamuk, and T. E. Byers, "Weight control practices of US adolescents and adults," *Annals of Internal Medicine*, 1993; 119: 667–671.