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# RISK OF EATING DISORDERS AMONG DIFFERENT CATEGORIES OF POPULATION RESIDING IN BANGALORE CITY -A CROSS SECTIONAL SURVEY

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## ABSTRACT

**Background:** Eating disorders are the most common psychiatric disorders which are not only prevalent in Western countries but also the most common ones in developing countries. Eating disorders though having high prevalence are still under studied in India. **Aim:** To assess the prevalence of Eating disorders among different age groups, gender and among different BMI of population in Bangalore. **Materials and methods:** A cross sectional study where a total of 881 individuals were included in the study. A scientifically validated questionnaire 'SCOFF' was used to assess the prevalence of EDs. Chi square statistical test was used to analyse the variables. **Results:** 41.9% of the population had a risk of developing an eating disorder. Females were at higher risk (44.88%) of developing EDs. It was seen to be higher in teens (age group of 13-19 years) 49.6%. Overweight individuals had an urge to develop an ED (55.5%). There was no significant correlation between age and SCOFF scores. There was a significant correlation between BMI values, medical, paramedical and non -medical groups and SCOFF scores **Conclusion:** The prevalence of EDs have to be studied more in India and other Asian countries. Proper education, awareness and guidance ought to be given to the vulnerable population along with psychiatric support whenever necessary.

**KEYWORDS:** Eating disorders (EDs), age, BMI, gender.

## INTRODUCTION

Eating disorders are serious and often fatal conditions that are related to persistent disordered eating behaviours that negatively impact health, emotions and ability to function in important areas of life. These disorders are psychiatric illnesses that have significant psychological, social, medical, and economic consequences. According to DSM-5 there are three main types of eating disorders - Anorexia Nervosa, Bulimia nervosa and Binge eating disorders.[1]

Once known to be a rarity, they are now common all over the world. Many factors influence the rise in eating disorders worldwide. Few indicators for ED are being over consciousness about food intake, about body weight, and shape. Eating disorders can harm the heart, digestive system, bones, teeth and mouth, and lead to other diseases.[2] Some studies suggested that globalization, internationalization or westernization have brought the ideal of beauty and maintaining a thin body, as well as the value of beauty and social norms of Western cultures to non-Western countries, societies, and people, which may lead to the rise in the occurrence of eating disorders. These behaviours can significantly impact the body's ability to get appropriate nutrition.[3-5]

Eating disorders often develop in the teen age and young adult years, although they can develop at other ages. It is seen that EDs are more common in females than in males. With treatment, one can return to healthier eating habits and sometimes reverse serious complications caused by the eating disorder.[6]

With the increasing prevalence rates of EDs in developing countries, it continues to be an under researched topic especially in India, which made the researchers carry out the survey and so as to create awareness regarding the same. We undertook the present cross sectional survey with the objectives of assessing the prevalence of risk of developing EDs in the general public of Bangalore, discern current trends, so as to provide directions by highlighting the gaps in research work in this particular area.

## METHODOLOGY

A cross sectional survey was conducted for screening individuals for Eating disorders. SCOFF questionnaire being one of the validated screening tools was used to assess the prevalence among different categories of population in Bangalore.

**INSTRUMENT**

The **SCOFF questionnaire**, developed by Morgan et al. is an eating disorder screening questionnaire[7], which contains 5 questions regarding aspects of eating disorders such as vomiting, concerns about losing control over how much one eats, weight loss, feeling fat and whether food dominates life. The questions of SCOFF are as follows.

1. Do you make yourself SICK because you feel uncomfortably full?
2. Do you worry that you have lost CONTROL over how much you eat?
3. Have you recently lost more than ONE stone (6.5kg) in a 3-month period?
4. Do you believe yourself to be FAT when others say you are too thin?
5. Would you say that FOOD dominates your life?

These questions are answered by either 'yes' or 'no'. Having two or more 'yes' responses on the SCOFF questionnaire indicates that the participant could be at a high risk of having anorexia nervosa or bulimia nervosa. Some previous studies showed good reliability, effectiveness and a convenient administration of the SCOFF questionnaire.[19, 20]

Data was collected for a period of 2 months i.e., July and August 2019. Previous studies showed the prevalence of Eating disorder to be 35%. Hence using 35% as a reference in Indian population, the sample size was calculated to be 354, at a confidence level of 95% CI. Informed consent was obtained from all the participants.

**Body mass index**

Height and weight as self-reported by individuals were used to calculate the Body Mass Index (BMI). The BMI was calculated by dividing body weight in kilograms by the square of height in meters. The classification used in this study was as follows: BMI ≥30.00 indicated obesity, BMI ≥ 25.00 overweight, BMI = 18.50 – 24.99 was taken as normal range. There is another recommendation to classify the BMI in the Asian population by the WHO: A BMI ≥ 27.50 indicates a higher risk for obesity, a BMI = 23.00 – 27.50 an increased risk of being overweight, a BMI =18.50 – 23.00 defines the normal range, and a BMI of less than 18.50 is considered as underweight.[8]

**Data analysis**

All variables defined in the study were analysed using MS excel 2013. The study population was distributed into specific groups of age, gender, BMI, educational status and Income. Descriptive analysis was made for age and BMI. Chi square test was applied to find the association between the variables and SCOFF scores.

**RESULTS**

**Characteristics of the participants**

In the current survey, the questionnaires were distributed to 1500 people. A total of 881 participants completed the questionnaire, with a response rate of 59%. Among 881 individuals who participated in the survey, 623(70.7%) were females and 258(29.3%) were males. The study population was distributed into different groups based on age, 102 belonged to age group 13-19 years, 667 belonged to age group 20-35 years, 97 belonged to age group 36-50 years and 15 were above 50 years of age. Based on professional status the study population were categorised as medical/paramedical and non-medical where 336 belonged to the first group and 545 to the latter. The mean age ± SD of the respondents was 25.90 ± 1.25 years while BMI mean ± SD was 23.17 ± 1.4 kg/m2. Based on BMI classification, 511 (58%) of the participants had BMI in the "normal" range, 195 (22.13%) in the "overweight" range and 175 (19.86%) in the "obese" range.

**Table I: Distribution of study population based on socio demographics characteristics with respective SCOFF details.**

| Socio-demographic Details | N | Percentage (%) | No. of 2 or more than 2 "yes" response for SCOFF | No. of "yes" for less than 2 response for SCOFF |
|---|---|---|---|---|
| **Age (Years):** | | | | |
| 13-19 | 102 | 11.5 | 49 | 53 |
| 20-35 | 667 | 75.7 | 282 | 385 |
| 36-50 | 97 | 11.01 | 39 | 58 |
| Above 50 | 15 | 1.7 | 1 | 14 |
| **Gender:** | | | | |
| Male | 258 | 29.3 | 70 | 188 |
| Female | 623 | 70.7 | 267 | 356 |
| **Education background:** | | | | |
| Medical/ paramedical | 336 | 38.13 | 180 | 156 |
| Non-medical | 545 | 61.86 | 175 | 370 |
| **Income:** | | | | |
| Low income group | 124 | 14.07 | 25 | 99 |
| Middle income group | 362 | 41.08 | 87 | 275 |
| High income group | 395 | 44.83 | 223 | 172 |

**Table II: Distribution of study population based on BMI according to Asian cut-offs with respective SCOFF details.**

| BMI (kg/m2) | Frequency | Percentage (%) | No. of 2 or more than 2 "yes" response for SCOFF | No. of "yes" for less than 2 response for SCOFF |
|---|---|---|---|---|
| **Normal (18-22.9)** | 511 | 58.00 | 214 | 297 |
| **Overweight (23.0- 24.9)** | 195 | 22.13 | 97 | 98 |
| **Obese (>25)** | 175 | 19.86 | 44 | 131 |

**Table III: Descriptive statistics of SCOFF scores.**

| *SCOFF questions* | *Frequency of yes(N=881)* | *Percentage (%)* |
|---|---|---|
| 1. Do you make yourself Sick (vomit) because you feel uncomfortably full? | 194 | 22.02 |
| 2. Do you worry that you have lost Control over how much you eat? | 268 | 30.41 |
| 3. Have you recently lost more than one stone (6.5kgs) weight in the last 3 months? | 68 | 7.70 |
| 4. Do you believe yourself to be Fat when others say you are thin? | 365 | 41.43 |
| 5. Would you say that Food dominates your life? | 399 | 45.30 |

| No. of questions | Frequency of yes | Percentage (%) |
|---|---|---|
| 0 | 254 | 28.7 |
| 1 | 267 | 30.3 |
| 2 | 132 | 14.9 |
| 3 | 175 | 19.8 |
| 4 | 53 | 6.07 |
| 5 | 0 | 0 |

Out of the 881 participants 360 participants said yes to 2 or more than 2 questions (132 for two questions, 175 for three questions and 53 for four questions), 267 participants said yes to one question and 254 participants said no to all the questions. This study showed that 40.8% of the total study population gave 'yes' response to 2 or more questions in SCOFF as shown in Table 3.

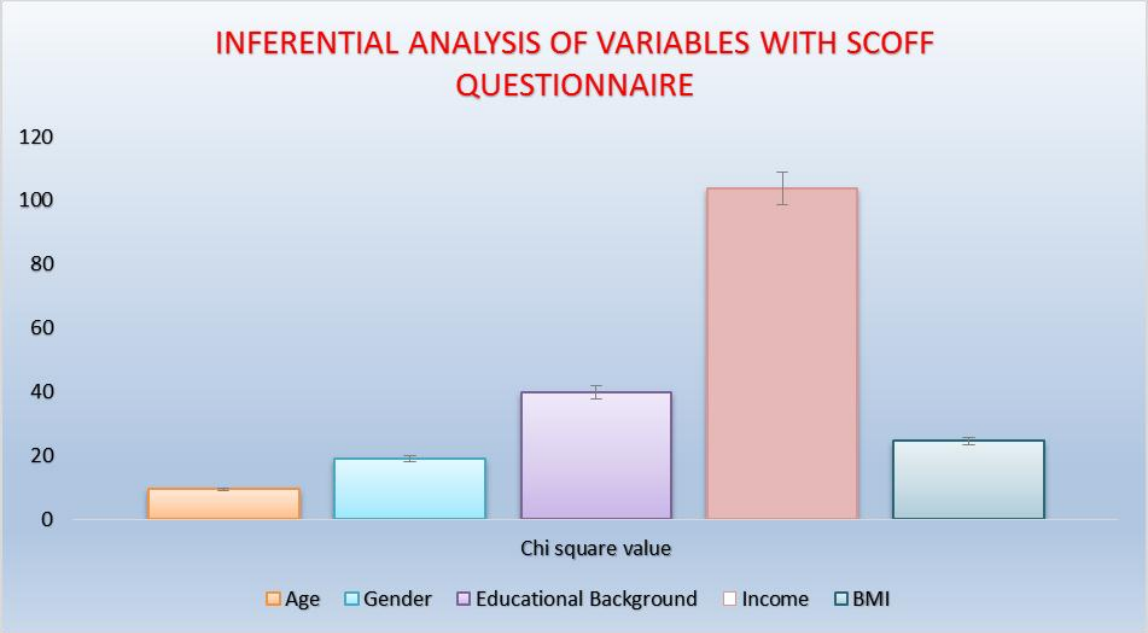
**Table 4: Inferential analysis of variables with SCOFF scores.**

| Characteristic/variable | Chi square value | P value |
|---|---|---|
| Age | 9.3528 | 0.2495 |
| Gender | 19.101 | 0.000012** |
| Educational background | 39.79 | <0.0001** |
| Income | 103.82 | 0.345 |
| BMI | 24.46 | <0.0001** |

**** denotes significant association of variables with SCOFF scores where p <0.05**

**Univariate analysis of SCOFF scores**

There was no significant correlation between age and SCOFF scores (p = .2495). However, there was a significant correlation between BMI values and SCOFF scores (chi square value = 24.46, p < 0.0001). It was also observed that females with higher BMI values had higher SCOFF scores, which is consistent with results obtained on the SCOFF (chi square value= 19.101, p=0.000012). Furthermore, there was a significant difference in SCOFF scores between participants with medical/paramedical and non- medical background (chi square value= 39.79, p = <0.0001).




## DISCUSSION

A longitudinal study conducted in the USA for 8 years by Stice, Marti et al. showed that 5.2% of the females met criteria for DSM5 anorexia, bulimia, or binge eating disorder. When nonspecific eating disorder symptoms were included, a total of 13.2% of the females had suffered from a DSM-5 eating disorder by age 20.[9] A study by Daniel Eisenberg, Emily. J. Nicklett et.al, showed 13.5% of women & 3.6% of men had the prevalence for ED's. Another study reported 78.4% of females to be at a higher risk of developing ED than males. In our study 42.85% of females, 27.3% of males possibly suffered from ED which can be correlated with the studies mentioned above.[10]

According to the study conducted by Solmi et.al, teens (23.2%) among the entire population were at greater risk of suffering from ED's. Our study also showed the results which was in accordance with the study conducted by Solmi et.al, where age group between 13-19 years were at higher risk (45.3%) and younger adults were next age group to be at higher risk of developing an Eating disorder.[1] Another study conducted by Paul Rohde et.al, showed that older age was associated with lower rates of disordered eating habits where the conclusion from our study was same i.e., only 6.6% of them were at possible risk of developing ED.[12]

A study conducted by Nayeong K, Duong Minh Tam et.al, in Vietnam showed 48.8% participants answered 2 or more "yes" responses for SCOFF questions.[13] 26.06% of participants were prone to develop an ED according to SCOFF scores as per a study conducted by Niveditha.N., G.Sreenivasa et.al, Mysore.[14] A study by Jugale et.al showed 42.7% of the study population were suspected with ED's.[15] Study conducted by Shashank et.al, 17.2% of participants had disordered eating behaviours as per SCOFF. Our study showed that 40.8% of the total study population were at risk of developing an ED as per SCOFF scores.[16]

22.75% of medical Undergraduate students were at high risk of suffering from ED according to a study conducted in Hanoi University. Our study concluded with the result that 53.5% of study population with medical background were more likely to suffer from ED.[13]

29.6% of individuals with normal BMI gave positive replies for developing an ED as per a study by Akthar Amin Memon, Syeda Ezz-e-Rukhshan et.al, Karachi, Pakistan.[17] 23.5% of the individuals with high risk of ED were overweight according to a study conducted by Niveditha.N. G.Sreenivasa et.al, Mysore.[14] Our study concluded that 55.42% of overweight individuals were at higher risk of developing ED as in terms with above mentioned study results.

A study conducted by Eisenberg concluded that there was significant difference between female-male groups (Chi square = 152, $p<0.0001$).[10] Our study also showed statistical significance of developing ED in females with a p value of <0.0001. There was a positive association ( chi square value= 24.46, $p<0.0001$) between BMI and development of ED which is in accordance with the study conducted by Niveditha.N., G.Sreenivasa et.al, Mysore showed statistical significance of BMI with ED ($P = 0.0001$). But there was no significant association between age and SCOFF scores.[14]

**There were no conflicts of interest in this study**

## LIMITATIONS

The main limitation of our study is that the standard diagnostic tools with high specificity and sensitivity like Eating Attitudes Test (EAT-26) and Binge Eating Scale (BES) were not used which gives better results in differentiating a specific Eating disorder (ED) Another

limitation is that the population who are at higher risk of eating disorders could be studied further which helps in assessing the aspects of comorbidities, generalised health status, habits, exercise and substance use.

## CONCLUSION

The prevalence of EDs ,their causes and all the factors have to be studied more in India and other Asian countries as it is observed that EDs are much prevalent not only in developed or westernized countries. EDs if neglected lead to severe morbidity and mortality. Proper education and awareness should necessarily be provided to the general public. Guidance along with good psychiatric support and treatment ought to be given to the vulnerable population.

## REFERENCES


1. Eating disorders. Compilation prepared by NIH https://www.nimh.nih.gov/health/topics/eating-disorders/index.shtml (Accessed on 29th Aug 2019)
2. Eating Disorders: Causes, Symptoms, Signs & Medical Complications prepared by eating disorders hope https://www.eatingdisorderhope.com/information/eating-disorder (Accessed on 3rd Sep 2019)
3. Ruth H. Striegel-M, Francine R. Gender Difference in the Prevalence of Eating Disorder Symptoms. Int J of Eat Disord, 2009; 42: 471–474.
4. Gorden RA. Eating disorders East and West: A culture-bound syndrome unbound. Eating disorders and cultures in transition. Edited by Nasser M, Katzman MA, Gordon RA. New York: Brunner-Routledge, 2001; 1–16.
5. Miller MN, Pumariega AJ. Culture and eating disorders: a historical and cross-cultural review. Psychiatry, 2001; 64(2): 93–110.
6. Makino M, Tsuboi K, Dennerstein L. Prevalence of eating disorders: a comparison of western and non-western countries. Medscape General Medicine, 2004; 6(3): 49.
7. John FM. The SCOFF questionnaire: a new screening tool for eating disorders. BMJ, 1999; 319: 1467–1468.
8. World Health Organization expert consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet, 2004; 363: 157–63.
9. Stice E, Marti CN. An 8-year longitudinal study of the natural history of threshold, subthreshold, and partial eating disorders from a community sample of adolescents. J Abnorm Psychol, 118(3): 587-97.
10. Dr. Daniel E, Dr. Emily JN. Eating Disorder Symptoms among College Students: Prevalence, Persistence, Correlates, and Treatment-Seeking. J Am Coll Health, 2011; 59(8): 700–707.
11. Francesca S, Stephani L. Validation of the SCOFF Questionnaire for Eating Disorders in a Multiethnic General Population Sample. Int J Eat Disord, 2015; 48: 312-316.
12. Paul R, Eric S, Heather S, Jeff M, and Olivia C. Ohls. Age Effects in Eating Disorder Baseline Risk Factors and Prevention Intervention Effects. Int J Eat Disord, 2017 November; 50(11): 1273–1280.
13. Nayeong K, Duong MT, Nguyen KV, Peter S, Michael W, Almut Z. Disordered eating behaviors in university students in Hanoi, Vietnam; J of Eat Disord, 2015; 3: 18.
14. Nivedita N, G. Sreenivasa. Eating disorders: Prevalence in the student population of Mysore, South India. IJPsy, 2018; 60:4, 433-437
15. Jugale PV, Pramila M, Murthy AK, Rangath S. Oral manifestations of suspected eating disorders among women of 20-25 years in Bangalore City, India. J Health Popul Nutr, 2014; 32: 46-50.
16. Shashank KJ, Gowda P, Chethan TK. A cross sectional study to assess the eating disorder among female medical students in a rural medical college of Karnataka State. Natl J Community Med, 2016; 7: 524-7.
17. Akhtar AM, Syeda E. Eating disorders in medical students of Karachi, Pakistan-a cross-sectional study doi: Memon et al. BMC Research Notes, 2012; 5: 84.
18. Smink FR, van Hoeken D, Hoek HW. Epidemiology of eating disorders: incidence, prevalence and mortality rates. Curr Psychiatry Rep, 2012 Aug; 14(4): 406-14.
19. Raghad NS, Razan AS, Heba HY, Waleed MS. Disordered eating attitudes in female students of An-Najah National University: a cross-sectional study. Journal of Eating Disorders, 2018; 6: 16.
20. Kathleen MP, and Patricia ED- The rise of eating disorders in Asia: a review. J Eat Disord, 2015; 3: 33.