



Likelihood of Eating Disorders and its Co-occurrence with Anthropometric Indicators by using SCOFF Questionnaire in Females in District Hyderabad, Pakistan

Jamshed Warsi¹, Benazir Mahar¹, Tazeen Shah², Hanozia Shah³

¹Department of Physiology,
University of Sindh,
Jamshoro, Pakistan

²Department of Physiology,
Liaquat University of
Medical and Health
Sciences, Jamshoro

³Department of Physiology,
Bilawal Medical College,
LUMHS, Jamshoro

Corresponding Author:

Jamshed Warsi

Email:

jamshed.warsi@usindh.edu
.pk

Abstract

Background: Eating disorder is the heterogeneous group of disorders associated with either complete or partial withdrawal or excessive intake of food. The prevalence of Eating disorders EDs is increasing day by day because of the fluctuating eating habits in order to keep thin or slim or what we called as the socially accepted fitness. The prevalence of eating disorder is not only upsurging in developed countries but also in developing countries especially in Pakistan, where the population shows a mix blend of malnutrition and Eating disorders, at one hand the few cities are showing severe malnourished, on the other hand high prevalence of eating disorders is reported in some other cities. The present study thus revealed the occurrence of eating disorders and its association with anthropometric indicators.

Methods: A cross sectional study was designed and the survey was conducted by using SCOFF questionnaire and self designed questionnaire. The sample size (n) was 445. An apparently healthy females aging between 18-25 was recruited through random sampling method.

Results: The younger age group (18-21 years) is at more risk of likelihood of Eating disorders. The risk of EDs is associated with urbanization, junk food and marital status of women. The anthropometric indices (Weight, waist, Hip circumference, BMI, Waist to hip ratio, waist to height ratio, biceps and triceps) were significantly increased in SCOFF positive female (p-values: 0.0005, 0.0004, 0.01, 0.0001, 0.01, 0.0004, 0.0002 and 0.0004 respectively).

Conclusion: the study concludes occurrence of EDs and its association with anthropometric factors.

Keywords: SCOFF, Body Mass Index, Anthropometric indices, Junk food

Introduction

Eating disorders (Eds) are the life threatening group of mental disorders which are characterized by abnormal eating habits(1). The individual either eat insufficient or excessive

calories (some time followed by an attempt to compensate it) which usually leads to mental, physical and behavioral health issue (2). The anorexia nervosa patients have the fear of gaining weight despite the fact that they are already underweight (3), binge eating which could be a main component of eating disorders

is the ingestion of large amount of food without control (4) another potential candidate in a row is Bulimia nervosa (BM) characterized by eating large amount of food within few hours and then try to compensate through purging, fasting, exercise or over dosing insulin in case of diabetes type I (5) The Eating disorders not otherwise specified (EDNOS) does not meet the criteria for Anorexia nervosa or bulimia nervosa (6).

The group of eating disorders is linked with various factors: stress could be an influential moderator of ovarian hormones on binge eating in female (4), Eds and disordered eating symptoms in type I diabetes adolescents (7) and in Type II diabetes (8), cardiac arrest (9) and even the suicidal attempts or suicidal intent in anorexic or bulimic patients (10) especially in female (11) is reported. Furthermore, the anthropometric indicators and the social status are also associated with different kind of eating disorders in general or in target populations. Anorexia nervosa is associated with low BMI (12) and low body weight (13) by contrast Binge eating is positively associated with higher BMI (14) another study shows increased BMI association with increased risk of EDs, nonetheless increased WHR is negatively associated with the risk of Eds (15). On the contrary, an interesting study was performed in which selective visual attention for ugly and beautiful parts of the body was observed in normal and Eating disorders female, it doesn't show any difference in waist to hip ratio of both groups (16). Hence we could not find a comprehensive study indicating all the anthropometric indicators in EDs particularly, in female.

The current study thus explored the screening of eating disorders and its co-occurrence with anthropometric indicators and the menstrual flow by using SCOFF questionnaire (17, 18) in a female of district Hyderabad Pakistan. SCOFF questionnaire is a valid and useful test to screen out the likelihood of eating disorders; it has been translated in Chinese language (19), French version (20) and Danish version (21). For this study the English version of SCOFF questionnaire was used.

Methodology

A Survey based study was performed in a fixed time scale (June 2018 to January 2019(08 months). The sample was collected through a random sampling method from the University of Sindh, Jamshoro,

Pakistan. A written consent was obtained from the volunteer before the data collection. The sample size (n) was 333. A Specifically designed questionnaire for the purpose of recording weight height, BMI, WHR and WHtR and a specific questionnaire for detection of likelihood of eating disorder; SCOFF QUESTIONNAIRE(22) was distributed during investigation/interview to the female participants aged between 17-25 years. The SCOFF questionnaire is a valid and reliable questionnaire to screen the likelihood of eating disorders. According to the authors of questionnaire, the cut-off was taken as two or more points for the likelihood of eating disorders. While having measurements and interview it was taken care that the participant understands the questionnaire fully, all the recruits were investigated at the same time of the day at normal room temperature. The study group constitutes single and/or unmarried female adolescents. Furthermore; the participants who were suffering from any disease (digestive, cardiovascular disease and diabetic mellitus I or/ and II were excluded from the study. The sample was divided into those who were having normal menstrual flow(23) and those who have irregular menstrual flows (24).

An anthropometric measurement BMI was calculated by the formulae (Weight/Height²). Weight is measured by simple weighing machine and Height by Stadiometer. Hip and waist, were measured by flexible but non stretchable plastic measuring tape. Waist to hip ratio (WHR) and waist to height (WHtR) were calculated as mentioned previously (25).

Statistical Analysis:

Data are calculated as mean $\pm$ SD and percentages; n represents the number of female reported. The data were tested & analysed for significance by using SPSS 21 (Statistical package for social sciences), student t test (unpaired), Mann Whitney test or fisher's exact Test were calculated as appropriate. Results with $p < 0.05$ were taken statistically significant. The real p values were shown in tables.

Results

Out of 345, 333 participants returned the complete and properly filled questionnaires hence the response rate was 96.52%. As shown in Table.1, the younger age group (18-21 years) were more prone to eating disorder as compared to older group (22-25 years) furthermore Urbanized and single female are at more risk of having the likelihood of eating disorders. The

junk food eaters have significantly at more risk. The risk of eating disorders was found in all classes of BMI however the highest prevalence was seen in those who were having normal BMI.

Table. 1: SCOFF results in relation to age, living area, marital status, breakfast, junk food, menstrual status and BMI

	Parameters	SCOFF positive	SCOFF negative	Total	p-value
1.	AGE				
	18-21	202(61%)	88(26%)	290(87%)	0.7
	22-25	31(9%)	12(4%)	43(13%)	
2.	LIVING AREA				
	Rural	66(20%)	31(9%)	97(29%)	0.7
	Urban	167(50%)	69(21%)	236(71%)	
3.	MARITAL STATUS				
	Single	232(69.7%)	100(30%)	332(99.7%)	1.0
	Married	01(0.3%)	00(0.0%)	01(0.3%)	
4.	BREAKFAST				
	Yes	166(50%)	73(22%)	239(72%)	0.7
	No	67(20%)	27(8%)	94(28%)	
5.	JUNK FOOD				
	Rare	122(37%)	64(19%)	186(56%)	0.049
	Often	111(33%)	36(11%)	147(44%)	
6.	MENSTRUAL STATUS				
	Regular	220(66%)	98(29%)	318(95%)	0.2
	Irregular	13(4%)	02(1%)	15(5%)	
7.	BMI				
I	Severely Underweight	15(4.5%)	18(5.4%)	33 (9.9%)	0.00001
II	Underweight	50 (15%)	29(8.7%)	79(23.7%)	
III	Normal	129(38.7%)	45(13.5%)	174(52%)	
IV	Overweight	34(10%)	08(2.4%)	42(12.6%)	
V	Obese Class I	05(1.5%)	00(00%)	05(1.5%)	

Fisher's exact Test

As shown in Table.2. Weight, waist, Hip circumference, BMI, Waist to hip ratio, waist to height ratio, biceps and triceps were significantly increased in SCOFF positive as compared to SCOFF negative females.

Table. 2: Anthropometric measurements of participants (mean±SD).

Anthropometric indices	SCOFF positive	SCOFF negative	p-Value
Age(years)	19.7±1.45	19.7±1.29	0.9
Weight(Kg)	50.4±10.17	46.3±7.70	0.0005 #
Height (cm)	153.0±16.39	154.6±6.36	0.2#
Waist (cm)	77.0±11.76	72.0±10.58	0.0004*
Hip (cm)	91.5±12.22	89.3±6.87	0.01#
BMI(Kg/m ²)	21.2±4.09	19.5±3.33	0.0001*
WHR	0.88±0.56	0.80±0.10	0.01*
WHtR	0.49±0.07	0.46±0.06	0.0004*
Bicep	22.4±4.15	20.7±3.41	0.0002*
Tricep	29.4±5.08	27.7±4.9	0.004#

Mann Whitney test

* Unpaired t test

Discussion

The results indicates that Eating disorder is equally found in both age groups (18-21 & 22-25), The results are consistent with the study carried out previously (2). Similarly, It could not show the significant difference between rural and/or urban dwellers in contrary to the strong evidence that urbanization is linked to bulimia nervosa but not anorexia nervosa (26). The marital status of the female cloud not shows the possible link between married or unmarried status of female. This is because of limitation that the sample almost comprises of unmarried female and could not show the good representation of married female due to random sampling method and could get a big unmarried female which were the core representatives of this particular age group. Nonetheless, there is a strong evidence of link between marital status and/or in the context of relationship and Eds (27, 28). Similarly the results could not established significant correlation with menstrual flow. Those who were taking junk food (rare or often) have the just significant chances of likelihood of eating disorders again there are strong evidence that junk food has the positive correlation with incidence of eating disorders (29). EDs were found uniformly in all classes of BMI.

An important aspect of the study is the comprehensive comparison of anthropometric indicators in SCOFF positive and negative participant. Interestingly, the measurement of weight, waist, hip circumference, BMI, WHR, WHtR, biceps and triceps were found significantly higher in SCOFF positive than SCOFF negative female. The literature survey indicates that the association of some indicators (hip circumference, WHtR, bicep and triceps) with Eds is not carried out yet hence is a novel finding. Low BMI and low body weight was found in Anorexic people (13) on the contrary, Eds are most common in high weight male and female (30). According to this study, BMI and weight is significantly higher in SCOFF positive female hence, consistent with latest research. The limitation of the study is a small sample size, hence it is suggested that a comprehensive cross sectional study should be carried out with a big sample size, furthermore the molecular mechanism should be investigated for fluctuated anthropometric indicators in eating disorders patients.

Conclusion

In conclusion, on the basis of significant differences in aforementioned groups, co-occurrence of likelihood of eating disorders and fluctuated anthropometric indicators were observed, additionally the association of eating disorders with junk food habits, breakfast and menstrual flow was reported in young affluent university going female students.

Disclosure statement

The authors declare that they do not have any financial or ethical conflict of interests and nothing to disclose.

Ethical Approval:

All the experimentations were carried out in accordance with 1964, Helsinki Declaration and its later amendments for ethical standards.

References

- Hudson JI, Hiripi E, Pope Jr HG, Kessler RC. The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biol Psychiatry*. 2007;61(3):348-58.
- Memon AA, Adil SE-e-R, Siddiqui EU, Naeem SS, Ali SA, Mehmood K. Eating disorders in medical students of Karachi, Pakistan-a cross-sectional study. *BMC research notes*. 2012;5(1):84.
- Mitchell JE, Crow S. Medical complications of anorexia nervosa and bulimia nervosa. *Current Opinion in Psychiatry*. 2006;19(4):438-43.
- Fowler N, Vo PT, Sisk CL, Klump KL. Stress as a potential moderator of ovarian hormone influences on binge eating in women. *F1000Research*. 2019;8.
- Wade TD. Recent Research on Bulimia Nervosa. *Psychiatr Clin North Am*. 2019 Mar;42(1):21-32. PubMed PMID: 30704637.
- Fairburn CG, Bohn K. Eating disorder NOS (EDNOS): an example of the troublesome "not otherwise specified"(NOS) category in DSM-IV. *Behav Res Ther*. 2005;43(6):691-701.
- Toni G, Berioli MG, Cerquiglini L, Ceccarini G, Grohmann U, Principi N, et al. Eating Disorders and Disordered Eating Symptoms in Adolescents with Type 1 Diabetes. *Nutrients*. 2017 Aug 19;9(8). PubMed PMID: 28825608. Pubmed Central PMCID: 5579699.
- Ji J, Sundquist J, Sundquist K. Association between anorexia nervosa and type 2 diabetes in Sweden: Etiological clue for the primary prevention of type 2 diabetes. *Endocr Res*. 2016 Nov;41(4):310-6. PubMed PMID: 26906648.
- Piotrowicz E, Orzechowski P, Bilinska M, Przybylski A, Szumowski L, Piotrowicz R. Implantable cardioverter-defibrillator therapy in a 34-year-old patient with eating disorders and after the third sudden cardiac arrest. *Int J Eat Disord*. 2015 Mar;48(2):253-7. PubMed PMID: 24535846.
- Pompili M, Mancinelli I, Girardi P, Accorrra D, Ruberto A, Tatarelli R. [Suicide and attempted suicide in anorexia nervosa and bulimia nervosa]. *Ann Ist Super Sanita*. 2003;39(2):275-81. PubMed PMID: 14587228. Suicidio e tentato suicidio nell'anorexia nervosa e nella bulimia nervosa.
- Franko DL, Keel PK, Dorer DJ, Blais MA, Delinsky SS, Eddy KT, et al. What predicts suicide attempts in women with eating disorders? *Psychological medicine*. 2004 Jul;34(5):843-53. PubMed PMID: 15500305.
- Hudson JI, Hiripi E, Pope HG, Kessler RC. " The prevalence and correlates of eating disorders in the national comorbidity survey replication": Erratum. 2012.
- Steinhausen H-C. The outcome of anorexia nervosa in the 20th century. *Am J Psychiatry*. 2002;159(8):1284-93.
- Hudson JI, Lalonde JK, Berry JM, Pindyck LJ, Bulik CM, Crow SJ, et al. Binge-eating disorder as a distinct familial phenotype in obese individuals. *Arch Gen Psychiatry*. 2006;63(3):313-9.
- Babio N, Canals J, Pietrobello A, Pérez S, Arijia V. A two-phase population study: relationships between overweight, body composition and risk of eating disorders. *Nutr Hosp*. 2009;24(4).
- Jansen A, Nederkoorn C, Mulken S. Selective visual attention for ugly and beautiful body parts in eating disorders. *Behav Res Ther*. 2005;43(2):183-96.
- Morgan JF, Reid F, Lacey JH. The SCOFF questionnaire. *The Western journal of medicine*. 2000;172(3):164.
- Warsi J, Mahar B, Ansari S, Shah T. Screening of eating disorders by using SCOFF questionnaire in diabetic male patients of District Hyderabad, Sindh, Pakistan. *Pakistan Journal of Physiology*. 2020;16(2):41-4.
- Leung SF, Lee KL, Lee SM, Leung SC, Hung WS, Lee WL, et al. Psychometric properties of the SCOFF questionnaire (Chinese version) for screening eating disorders in Hong Kong secondary school students: A cross-sectional study. *Int J Nurs Stud*. 2009;46(2):239-47.
- Garcia FD, Grigioni S, Allais E, Houy-Durand E, Thibaut F, Déchelotte P. Detection of eating disorders in patients: validity and reliability of the French version of the SCOFF questionnaire. *Clin Nutr*. 2011;30(2):178-81.
- Lichtenstein MB, Hemmingsen SD, Støving RK. Identification of eating disorder symptoms in Danish adolescents with the SCOFF Questionnaire. *Nordic journal of psychiatry*. 2017;71(5):340-7.
- Hill LS, Reid F, Morgan JF, Lacey JH. SCOFF, the development of an eating disorder screening questionnaire. *Int J Eat Disord*. 2010;43(4):344-51.
- Drosdzol-Cop A, Bak-Sosnowska M, Sajdak D, Bialka A, Kobiolka A, Franik G, et al. Assessment of the menstrual cycle, eating disorders and self-esteem of Polish adolescents. *J Psychosom Obstet Gynaecol*. 2017 Mar;38(1):30-6. PubMed PMID: 27584558.

24. Vilsinskaite DS, Vaidokaite G, Macys Z, Bumbuliene Z. The risk factors of dysmenorrhea in young women. *Wiad Lek.* 2019;72(6):1170-4. PubMed PMID: 31175722.
25. WARSI J, PALH Z, QAMBRANI M, MEGHWAR S. Association of Anthropometric Measurements with pre and post Menopausal women: A survey based cross sectional study. *Sindh University Research Journal-SURJ (Science Series).* 2018;50(01):119-22.
26. van Son GE, van Hoeken D, Bartelds AI, van Furth EF, Hoek HW. Urbanisation and the incidence of eating disorders. *The British journal of psychiatry : the journal of mental science.* 2006 Dec;189:562-3. PubMed PMID: 17139044.
27. Friedman MA, Dixon AE, Brownell KD, Whisman MA, Wilfley DE. Marital status, marital satisfaction, and body image dissatisfaction. *Int J Eat Disord.* 1999;26(1):81-5.
28. Boyes AD, Fletcher GJ, Latner JD. Male and female body image and dieting in the context of intimate relationships. *Journal of family psychology : JFP : journal of the Division of Family Psychology of the American Psychological Association.* 2007 Dec;21(4):764-8. PubMed PMID: 18179349.
29. Kidd C, Loxton NJ. Junk food advertising moderates the indirect effect of reward sensitivity and food consumption via the urge to eat. *Physiol Behav.* 2018;188:276-82.
30. Duncan AE, Ziobrowski HN, Nicol G. The prevalence of past 12-month and lifetime DSM-IV eating disorders by BMI category in US men and women. *European Eating Disorders Review.* 2017;25(3):165-71.