



An Assessment of Eating Disorder among Adolescents and Young Adults

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ABSTRACT

Young males and females are highly concerned about their body image and physical appearance. They refrain themselves from eating that effect the physical and social well-being. This study aims at identifying the presence of eating disorder and to explore as well as confirm four factor solution of eating disorder among adolescents and adults. The study is conducted obtaining data from a sample of 600 adolescents and young adults studying in private and public educational institutions using EDE-Q questionnaire. Chi-square test has revealed the relationship between age and eating concern scores. Pearson correlation test suggested that age is related with global score whereas all the eating disorder scores are inter-related. No gender-wise difference between shape concern and global score is found whereas the global scores and shape concern scores are significantly different with respect to type of institution. Global score and shape concern scores are same for adolescents and young adults. Mean ranks are higher for males compared to females whereas there is significant difference among restraint scores gender-wise however shape concern, weight concern and restraint scores were significantly different in private and public institutions. Mean ranks for young adults are higher for restraint, shape concern, weight concern and eating concern scores compared to adolescents whereas the significant difference was observed between young adults and adolescents for restraint scores. EFA has identified four-factor solution for the EDE-Q subscales whereas CFA has also confirmed it. The four factor solution is weight and shape concern, fear of gaining weight, restraint and eating concern.

Keywords: Confirmatory factor analysis, Exploratory factor analysis, Eating disorder, Chi-square test, Pearson correlation

INTRODUCTION

Eating syndromes consist of inadequate food intake that can eventually harm in numerous ways. Eating disorder condition marks an unhealthy and harmful relationship with food, it is considered to be a serious medical problem that may lead to long term treacherous consequences, if not treated on time. These syndromes may tend to develop during any stage in life, most commonly reported among adolescents and adults. Perpetually it appears to occur during the teen years. Eating habits play a significant role in our lives as they maintain the functioning of our body and if they are neglected and not looked after, mental and physical abilities are overblown. Such disorders commonly co-exist with anxiety, substance abuse and depression [1].

People having problems eating can have a variety of symptoms; however, most of them include severe restraint of food, food splurges or inappropriate eating behaviors like nausea or over-exercising. The young population is profoundly associated with interpersonal interaction and replicating superstars and this reason clears misery and body disappointment among young people. Eating disorders are very confusing and despite many researchers proved that eating behaviors have various effects on their mental health, it can destroy them and may cause several diseases. The biological, behavioral, and social substructures of these diseases remain unclear and extent gradually in the whole body [2].

Opinions and behaviors about dieting and body size among 16 to 20-year-old females were determined. It was explored that female adolescents and women are at risk of developing an eating disorder [3]. It is alarming that future physicians are prone to stressful conditions and might be at a considerable high risk of contracting eating disorders

that would creel the availability of dependable medical services in the future. The earlier these disorders are diagnosed and assessed, the better the chances are for enhanced treatment and better recovery [4].

Eating Disorder Examination questionnaire [5] was used in various studies to identify an eating disorder. The EDE-Q consists of four subscales Restraint, Eating Concern, Weight Concern, and Shape Concern [6]. This questionnaire was used for adolescents, young adults, college students and undergraduates in several studies. This questionnaire was translated into various languages [7]. The objective of most of the researches was to measure the good fit models of EDE-Q in the clinical and community-based samples [8]. CFA (confirmatory factor analysis) has carried the best results for both students and non-students groups, both groups did not have any effects on goodness-of-fit with the three-factor model [9]. An individual with a higher global eating disorder score was overweight and obese and 30%-40% scoring disregarded shape and weight concern [10]. Females had higher global and subscale scores and are more involved in improper compensatory practices more frequently compared to males [11]. A CFA on the first four features of EDE-Q provided a model that was not a good fit whereas EFA of essential alliance factoring carried a three-factor model about shape and weight concern, restriction and obsession and eating concern of EDE-Q [12].

Factor loading and intercept were unchanged across gender and overweight status [13]. CFA was applied to compare the validity of the four-factor solution with three-factor, two-factor, one-factor and brief one-factor models [14] however CFA failed to support the four EDE-Q scores. Numerous studies have used EFA to explore the eating disorder factors, weight and shape dissatisfaction factor was explored in a study for Swedish girls and clinical girls whereas restraint, SC (shape concern) and WC (weight concern) were explored for boys [15]. There was a lack of information on the factor solution of the EDE-Q over genders. A four-factor displays a better fit with elements relating to dietary limitation, distraction and confinement, weight and SC, and eating disgrace [16]. According to a study, models with the first four-factor model of the EDE-Q together with optional three, two, a full one, and brief one-factor were applied. None of the models gave satisfactory information except the one-factor model that was the nearest to satisfactory however it did not perform well in veggie lovers [17]. Body dissatisfaction and eating disorder was a major problem that was commonly perceived in racial and minority groups [18]. The norms of the original four-factor model were verified and later the evaluation of psychological measurements among genders is carried. Eating disorder factors was higher in females compared to males [19]. The majority of the men had reported overheating problems and lack of concern about weight and body shape but the women had reported high concern about body image and have controlled their overeating. Major gender differences were observed, within the female samples essentially more probable than men to report evasion, skipping food, fasting and body image [20].

MATERIALS AND METHODS

The study aimed to determine the eating disorder among adolescents and young adults. 0.808 was the value of Cronbach's alpha. It was cross-sectional data from a sample of size 600 was conducted from adolescents and young adults within the age bracket of 12-26 enrolled in various public and private schools, colleges and universities of Lahore, Pakistan using EDE-Q questionnaire. Data were analyzed using chi-square test of association, Pearson correlation, and Mann Whitney U test. Further, EFA and CFA were applied to explore and confirm the proposed four-factor solution.

RESULTS

Table 1 Mean and standard deviation of EDE-Q score for 600 adolescents and young adults

EDE-Q Scores	Mean	Standard Deviation
Restraint	15.98	6.55
EC	14.77	5.83
SC	27	10.41
WC	15.97	6.51
GS	18.43	6.3

Table 1 demonstrates that young adults and adolescents are concerned more about their shape compared to other EDE-Q subscales.

Table 2 Mean (SD) scores of EDE-Q for adults by gender, Institutions and age group

EDE-Q Scores	Male	Female	Public	Private	Adolescents	Young Adults
Restraint	16.33 (5.81)	15.62 (7.20)	14.90 (6.65)	16.64 (6.40)	15.41 (6.33)	16.87 (6.79)
EC	14.92 (5.74)	14.62 (5.93)	14.48 (5.98)	14.95 (5.74)	14.42 (5.67)	15.31 (6.03)
SC	26.88 (9.70)	27.12 (11.09)	25.46 (10.03)	27.94 (10.54)	26.82 (10.24)	27.29 (10.69)
WC	16.16 (6.28)	15.78 (6.74)	15.31 (6.61)	16.37 (6.43)	15.68 (6.57)	16.42 (6.40)
GS	18.57 (5.81)	18.29 (6.76)	17.54 (6.21)	18.98 (6.30)	18.08 (6.27)	18.97 (6.31)

According to Table 2, average EDE-Q scores for restraint, EC, WC and GS are higher in males compared to females, whereas females are more worried about their body-shape compared to males. Mean EDE-Q scores for restraint, EC, SC, WC, and GS are higher in students who were studying in private sector institutions compared to public sector institutions however mean EDE-Q score for restraint, EC, SC, WC and GS are higher in young adults compared to adolescents.

Table 3 Test statistics of Mann-Whitney U test by gender, age, and sector

EDE-Q Scores	Gender (p-value)	Age (p-value)	Sector (p-value)
Restraint	0.035	0.011	0.001
Eating Concern	0.565	0.075	0.238
Weight Concern	0.32	0.15	0.031

Table 3 indicates that there is a significant difference in the restraint score of males and females as well as the significant difference in the restraint scores of adolescents and young adults and by sector it indicates that there is a significant difference in the restraint and WC scores of private and public sector institutions.

Table 4 Chi-square test of association between EDE-Q scores with respect to gender and age group

EDE-Q Scores	Gender (p-value)	Age (p-value)
Restraint	0.078	0.285
EC	0.437	0.01
SC	0.112	0.275
WC	0.207	0.329

Chi-square test of association has revealed that there is no association between the gender and EDE-Q subscale scores however there is no association between age group and Restraint, SC and WC whereas EC is associated with the age group (Table 4).

Table 5 Pearson correlation between Restraint, EC, WC, and SC correlations

Pearson Correlation	Restraint	EC	SC	WC	GS
Restraint	1	0.511**	0.524**	0.579**	----
EC	0.511**	1	0.711**	0.669**	----
SC	0.524**	0.711**	1	0.815**	----
WC	0.579**	0.669**	0.815**	1	----
Age	----	----	----	----	0.103*

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed)

According to the above table, all the EDE-Q scores are positively related and there is a significant relationship between all EDE-Q scores. Pearson correlation revealed that there is positive relationship between age and GS. Exploratory factors analysis and confirmatory factor analysis have revealed four factors, weight concern and shape concern, fear of gaining weight, restraint and eating concern (Table 5).

DISCUSSION

Eating Disorder is defined to be a potentially life-threatening illness that occurs due to irregular eating habits and concern about body weight and shape. According to the present study, approximately 50% of the individuals were male and 50% of them were females. In this study, 62% of the participants were from the private sector and 38% were from the public sector whereas approximately 61% of the individuals were adolescents and 39% were young adults. According to the present study, females were more concerned about their shape compared to males, the current study is in contradiction with the study by Ro, Reas, and Rosenvinge [10], Striegel-Moore, et al. [20], White, et al. [12], Unal, et al. [21], Musa, et al. [22], and Rand-Giovannetti, et al. [16] however the study is in line with the study by Luce, et al. [23], Quick and Byrd-Bredbenner [11], and Carey, et al. [19].

According to the present study, four factors were explored (weight and shape concern, fear of gaining weight, restraint and eating concern) that were the same for males and females whereas this study is in contradiction with a study by Mantilla, et al. [15] according to which weight and shape dissatisfaction factors were found in Swedish girls and clinical girls whereas restraint, shape concern, weight concern were found among boys.

According to the study by Darcy, et al. [24] and White, et al. [12] three factors were explored out of four with two factors considered the best fit among males. The main factor for all gatherings took after a joined shape and weight concern subscale whereas this study is in line with the current study in which weight and shape concern have also been combined as a single factor.

The study is in contradiction with the study of Darcy, et al. [24] which shows that a three-factor solution was the best fit for three out of four groups, with a two-factor solution providing the best fit for the male comparison group.

The current study has confirmed all the four factors of the EDE-Q which is in contradiction with the study of Penelo, et al. [6], according to that confirmatory factor analysis was used to confirm four EDE-Q scores but only two factors were confirmed. The study of Heiss, et al. [17] is also in contradiction with the current study because confirmatory factor analysis was also used in it to compare the fit indices of the four factors of EDE-Q but no model provided adequate fit of the data in either sample of respondents. The data confirmed difficulties in replicating the proposed factor structure of the EDE-Q whereas in the current study all four factors are confirmed.

The current study is in contradiction with the study by Carey, et al. [19] in which confirmatory factor analysis did not support the four factors whereas in the present study confirmatory factor analysis supported the four factors.

According to the study by Chan and Leung [14] only one factor was confirmed whereas it is in contradiction with the present study in which four factors were confirmed. According to the study by Zohar, et al. [7] confirmatory factor analyses declared the first-factor structure while weight and shape concerns combined into a single factor. The study is somehow in contradiction with the current study because all four factors were correlated and confirmed but in this study weight and shape concerns combined into a single factor.

CONCLUSION

The study concluded that females were more concerned about their shape whereas males were more concerned about their weight and restraint themselves from over-eating. It was further revealed that restraint, eating concern, shape concern, weight concern and global scores were higher in the students who were studying in the private sector compared to those studying in the public sector and was higher in young adults compared to the adolescents. It is evident from the present research that most of the respondents have anorexia nervosa disorder. The four factors of an eating disorder were confirmed by the model.

Implications and Contribution of Research

This research is an attempt to identify the eating disorder if any among adolescents and young adults. In this part of the world, the pattern of an eating disorder is dependent on cultural norms that are different from the west therefore this research will contribute significantly to the existing literature on eating disorder.

DECLARATIONS

Declaration on Human Subject Testing

We, the author's declare that no experiment or testing is performed on the human beings that were involved in the current research.

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

- [1] Eating Disorders, 2016. <https://www.nimh.nih.gov/health/topics/eating-disorders/index.shtml>
- [2] Fisher, Martin, et al. "Eating disorders in adolescents: A background paper." *Journal of Adolescent Health*, Vol. 16, No. 6, 1995, pp. 420-37.
- [3] Shaikh, Masood Ali, and Ayesha Kayani. "Detection of eating disorders in 16-20-year-old female students-perspective from Islamabad, Pakistan." *Journal of Pakistan Medical Association*, Vol. 64, No. 3, 2014, pp. 334-36.
- [4] Memon, Akhtar Amin, et al. "Eating disorders in medical students of Karachi, Pakistan-a cross-sectional study." *BMC Research Notes*, Vol. 5, No. 1, 2012, p. 84.
- [5] Fairburn, C. G., and S. Beglin. "Eating disorder examination questionnaire, cognitive behavior therapy and eating disorders." Guilford Press, New York, 2008.
- [6] Penelo, Eva, et al. "Psychometric properties of the Eating disorder examination questionnaire (EDE-Q) and norms for rural and urban adolescent males and females in Mexico." *PLoS One*, Vol. 8, No. 12, 2013, p. e83245.
- [7] Zohar, Ada H., Lilac Lev-Ari, and Rachel Bachner-Melman. "The EDE-Q in Hebrew: Structural and convergent/divergent validity in a population sample." *The Israel Journal of Psychiatry and Related Sciences*, Vol. 54, No. 3, 2017, pp. 15-20.
- [8] Allen, Karina L., et al. "Confirmatory factor analysis of the eating disorder examination-questionnaire (EDE-Q)." *Eating Behaviors*, Vol. 12, No. 2, 2011, pp. 143-51.
- [9] Barnes, Jennifer, Tim Prescott, and Steven Muncer. "Confirmatory factor analysis for the eating disorder examination questionnaire: evidence supporting a three-factor model." *Eating Behaviors*, Vol. 13, No. 4, 2012, pp. 379-81.
- [10] Rø, Øyvind, Deborah L. Reas, and Jan Rosenvinge. "The impact of age and BMI on Eating disorder examination questionnaire (EDE-Q) scores in a community sample." *Eating Behaviors*, Vol. 13, No. 2, 2012, pp. 158-61.
- [11] Quick, Virginia M., and Carol Byrd-Bredbenner. "Eating Disorders Examination Questionnaire (EDE-Q): norms for US college students." *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, Vol. 18, No. 1, 2013, pp. 29-35.
- [12] White, Hannah J., et al. "Eating disorder examination questionnaire: Factor structure for adolescent girls and boys." *International Journal of Eating Disorders*, Vol. 47, No. 1, 2014, pp. 99-104.
- [13] Grilo, Carlos M., et al. "Factor structure and construct validity of the eating disorder examination-questionnaire in college students: Further support for a modified brief version." *International Journal of Eating Disorders*, Vol. 48, No. 3, 2015, pp. 284-89.
- [14] Chan, C. W., and S. F. Leung. "Validation of the Eating Disorder Examination Questionnaire: An online version." *Journal of Human Nutrition and Dietetics*, Vol. 28, No. 6, 2015, pp. 659-65.
- [15] Mantilla, Emma Forsén, Andreas Birgegård, and David Clinton. "Factor analysis of the adolescent version of the Eating disorders examination questionnaire (EDE-Q): results from Swedish general population and clinical samples." *Journal of Eating Disorders*, Vol. 5, No. 1, 2017, p. 19.
- [16] Rand-Giovannetti, Devin, et al. "Psychometric properties of the Eating disorder examination-questionnaire (EDE-Q): A confirmatory factor analysis and assessment of measurement invariance by sex." *Assessment*, Vol. 27, No. 1, 2020, pp. 164-77.
- [17] Heiss, Sydney, James F. Boswell, and Julia M. Hormes. "Confirmatory factor analysis of the Eating disorder

- examination-questionnaire: A comparison of five factor solutions across vegan and omnivore participants.” *International Journal of Eating Disorders*, Vol. 51, No. 5, 2018, pp. 418-28.
- [18] Serier, Kelsey N., Jane Ellen Smith, and Elizabeth A. Yeater. “Confirmatory factor analysis and measurement invariance of the Eating disorder examination questionnaire (EDE-Q) in a non-clinical sample of non-Hispanic White and Hispanic women.” *Eating Behaviors*, Vol. 31, 2018, pp. 53-59.
- [19] Carey, Mark, et al. “Eating disorder examination questionnaire (EDE-Q): Norms and psychometric properties in UK females and males.” *Psychological Assessment*, Vol. 31, No. 7, 2019, pp. 839-50.
- [20] Striegel-Moore, Ruth H., et al. “Gender difference in the prevalence of eating disorder symptoms.” *International Journal of Eating Disorders*, Vol. 42, No. 5, 2009, pp. 471-74.
- [21] Ünal, E., et al. “Eating disorders and anxiety among high school students in Western area of Turkey.” *International Journal of Research in Medical Sciences*, Vol. 4, No. 8, 2017, pp. 3513-20.
- [22] MA, Bujang, Mohamad NA, and Radeef AS. “Norms for eating disorder examination questionnaire (EDE-Q) among Secondary School Students in Kuala Lumpur, Malaysia.” *International Medical Journal Malaysia*, Vol. 15, No. 2, 2016, pp. 57-61.
- [23] Luce, Kristine H., Janis H. Crowther, and Michele Pole. “Eating disorder examination questionnaire (EDE-Q): Norms for undergraduate women.” *International Journal of Eating Disorders*, Vol. 41, No. 3, 2008, pp. 273-76.
- [24] Darcy, Alison M., et al. “Factor structure of the Eating disorder examination questionnaire (EDE-Q) in male and female college athletes.” *Body Image*, Vol. 10, No. 3, 2013, pp. 399-405.