

Disordered Eating Attitudes and Their Correlates among Iranian High School Girls

*Bahram Pourghassem Gargari¹, Deniz Kooshavar¹, Neda Seyed Sajadi¹, Safoura Karami¹, Mahdiyeh Hamed Behzad¹, Hassan Shahrokhi²

¹a) Department of Biochemistry and Nutrition, Faculty of Health and Nutrition, b) Nutritional Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

² Department of Psychology, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

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ABSTRACT

Background: Disordered eating attitudes are contributing factors to the development of eating disorders. Adolescent girls are at high risk for eating diseases. In Iran, there is few data on the subject, especially in Azarian adolescent girls, so we did this study for assessing disordered eating attitudes and their correlates among Iranian Azarbaijani high school girls.

Methods: In a cross-sectional study, 1887 high school girls were selected. Eating Attitude Test-26 (EAT-26) and socio economical questionnaires were used. The EAT-26 score of 20 or higher defined as disordered eating attitudes. Data were analyzed using the Statistical Program for Social Sciences, by using from descriptive and analytical statistics.

Results: Reliability and validity of the translated EAT-26 were 0.80, 0.76, respectively. In studied subjects, mean (SD) of EAT-26 was 11.71(8.48). Totally, 16.7% (C.I with 95%: 15.1-18.3%) of students had disordered eating attitudes. About half of the participants were unhappy with their body weight and considered themselves as obese. Mean of EAT-26 was higher in this group. Groups, who intent to weight loss, were smoker, and who had age of menarche less than 11 years, also had higher EAT-26 scores. Parent's literacy or job, birth order, family size or income and house ownership had not any significant effect on EAT-26 score.

Conclusions: Persian version of EAT-26 has good reliability and validity for assessing disordered eating attitudes in Azarian girl adolescents. Prevalence of disordered eating attitudes among Azarian adolescent girls are in the range of some studies, but are less than Arabian countries, and some European ones. In adolescent girls, body weight dissatisfaction, smoking and early menarche has important role in eating attitudes.

Keywords: Adolescents; Female; Eating attitudes; Self-perception; Body weight

Introduction

Eating disorders are psychological and nutritional disorders. Their common features are disturbance of eating behaviors and attitudes. Their psychological and nutritional sequels are various. They can

lead to malnutrition, osteoporosis, amenorrhea, cardiovascular disease, and depression. Their severe clinical forms include anorexia nervosa and bulimia nervosa [1-3].

A growing number of subjects are showing inappropriate eating behaviors and attitudes without having severe forms. Early and prompt recognition of mild forms can prevent severe ones [1-3].

Adolescent girls are at high risk for disordered eating attitudes [3]. In adolescent girls, they are considered as the most prevalent diseases next to obesity and asthma [1, 3]. The incidence and prevalence of disordered eating attitudes are growing [1, 3]. Studies in countries such as: India [4], Singapore [5], Pakistan [6], Saudi Arabia [7, 8], Oman [9], the United Arab Emirates [10], Turkey [11], China [12], South Africa [13-15], Brazil [16, 17], together with studies in the US [18, 19], Canada [20], England [21, 22], Italy [23, 24], Spain [25, 26], Sweden [27], Israel [28, 29], and Japan [30-32] all indicate that eating disorders are not limited to developed countries or to special socio-economical groups.

In adolescent girls, prevalence of severe forms of eating disorders had been shown up to 5% [3], while their mild forms, in other words disordered eating behaviors and attitudes, are shown higher. For example in Singapore: 10.5% [5], Saudi Arabia: 24.6% [8], the United Arab Emirate: 23.4% [10], China: 10.8% [12], South Africa: 21.2% [13], Brazil: 15.76% [17], the US: 22-26% [18, 19], Canada: 16% [20], European countries up to: 18% [21-27], Israel: 32.4% [29] and Japan up to: 35% [32], of studied adolescents had disordered eating attitudes.

In Iran, there is limited data on the subject. Only one study in the Tehran has been done and it showed that up to 24.16% of high school girls had disordered eating attitudes [33]. In other groups of Iranian populations, including Azerbaijani groups, there is no study on the subject. With attention to the data scarcity, especially on Azerbaijani adolescents, we decided to determine prevalence of disordered eating attitudes in Azerbaijani female adolescents

and determine their relation to demographic factors, in Tabriz, Iran.

Materials and Methods

Participants

The study was cross-sectional and descriptive carried out during 2007-2008. Based on the previous studies [19, 20], calculated sample size was 1850 students. Of the 130 female high schools, 2000 students were recruited from 20 high schools in Tabriz City, center of the North-west Azarbaijan Province, by systematic random sampling. The study was carried out in all educational regions of Tabriz. According to data of Tabriz Guidance and Education, there are five educational regions in Tabriz. The study was approved by Tabriz University of Medical Sciences Vice Chancellor for Research. Written consent was obtained from parents of students. Participation was voluntary and anonymous. Data were collected with self-reported questionnaires. The research was reviewed and approved by an institutional review board.

Assessment Procedures

Eating Attitude Test-26

We used Eating Attitude Test-26 (EAT-26) [34] for assessment of disordered eating attitudes. The EAT-26 is 26-item, widely used, standardized, and self-reported questionnaire to identify abnormal eating attitudes. To complete the EAT-26, participants rate their responses on a 6-point scale (always, usually, often, sometimes, rarely, or never). The EAT-26 is divided into three subscales: Dieting (13 items), Bulimia and Food Preoccupation (six items), and Oral Control (seven items). The higher the final score, the more the person is preoccupied by food consumption. A score of 20 or more considered as disordered eating attitudes [34]. Primarily, EAT-26 was translated into Persian by help of a psychologist, then was given to

10 students and rewritten according to students comments on unclear questions.

Its validity and reliability was assessed in a pilot study. One hundred and ten students were selected. After giving information about the study, students completed the EAT-26. Two months latter, they responded again all questions, and then reliability and validity of EAT-26 were assessed. Test-retest coefficient for the EAT-26 was 0.8. The questionnaire's Cronbach's α (alpha) was 0.76. After approving of its reliability and validity, it was completed by students. EAT-26 score 20 or higher defined as disordered eating attitudes [34].

In addition to total score of EAT-26, its subgroups scores, i.e., Dieting, Bulimia and Food Preoccupation, and Oral Control were calculated. Sum of items: 1, 6, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24, and 25 were considered as Dieting. Sum of items: 3, 4, 9, 18, 21, and 26 were considered as Bulimia and Food Preoccupation. For Oral Control sum of items: 2, 5, 8, 13, 15, 19 and 20, were considered [34].

Demographics

A socio-demographic questionnaire was used for assessing of socio-demographic characteristics. This questionnaire had questions about parental education and occupation, birth order, house ownership family size and family income. Smoking and age of menarche were also asked.

Self-perception of body weight

Two questions were used for the assessment of self-perception of body weight. How is your weight for now? Are you satisfied with your current weight? [30].

Statistical analysis

Data were analyzed using the Statistical Program for Social Sciences, by using from descriptive and analytical statistics [35]. Chi-square analysis was

used to compare the prevalence of abnormal eating attitudes between different regions and age groups. Differences of mean values of EAT-26 scores among age groups, regions as well as among various responses to self-perception of body weight questions was evaluated by analysis of variance (ANOVA) followed by Tukey Post Hoc test. Pearson correlation coefficients were used to examine association between two continuous variables.

Results

Students less than 14 or higher than 19 years, because of low number were not included in data analysis. Data on some student were not complete, so they were omitted. The Final sample size was 1887 students.

Mean and standard deviations (SD) of age in studied participants were 16.46 ± 1.09 years. Age distribution of the participants in different age groups 14-14.99, 15-15.99, 16-16.99, 17-17.99 and 18-19 were: 216 (11.4%), 464 (24.6%), 546 (28.9%), 486 (25.8%) and 175 (9.3%), respectively.

Distributions of studied participants from five different educational districts were 447 (23.7%), 558 (29.6%), 292 (15.5%), 234 (12.4%) and 356 (18.9%), respectively. Fathers' literacy in more than of half of the students was higher than high school, while for mothers it was guidance (secondary). Mean (and SD) of family size was 5.14 ± 1.5 persons. In studied participants, 82 students (4.3%) were smoker or had smoking history. In studied students, mean (and SD) of menarche age was 13.04 ± 1.09 years.

EAT-26, disordered eating attitudes and their demographic correlates

Mean (and SD) of EAT-26 score was 11.71 ± 8.48 . Mean (and SD) of EAT-26 subgroups, i.e., Dieting, Bulimia and Food Preoccupation, and Oral Control were 7.06 ± 6.09 , 1.69 ± 2.02 and 2.90 ± 2.87 , re-

spectively. Three hundred and fifteen students (16.7%, Confidence Interval with 95%: 15.1-18.3%) had EAT-26 score of 20 or higher. Mean (and SD) of EAT-26 in disordered eating attitudes and non-disordered attitudes participants were 26.46±6.27 and 8.75±5.09, respectively. In Table 1, mean and SD of EAT-26 subgroups in students with EAT-26 ≥ 20 and EAT-26 < 20 are shown. EAT-26 subgroups were significantly different between disordered and non-disordered eating attitudes participants.

In Table 2 and 3, mean and SD of EAT-26 in different educational regions and age, groups and distribution of disordered eating attitudes in each group are shown. There was not any significant difference in mean of EAT-26 or prevalence of disordered eating attitudes in different age groups (F (5, 1887) = 1.56, P = 0.18 and X² = 5.18, df=4, P = 0.27, respectively). These differences in five educational regions were significant (F (5, 1887) = 3.7, P = 0.006 and X² = 12.55, df=4, P = 0.01, respectively). In smoking students, mean (and SD) of EAT-26 was 13.62 ± 10.01, while in non-smoking group it was 11.63 ± 8.4 (P < .05). 24.7% of smoking students had disordered eating attitudes, while in non-smoking students it was 16.5% (X² = 3.87, df=1, P < .05).

Mean (and SD) of EAT-26 in student's with menarche age below than 11

was significantly higher than those with menarche age ≥ 11 year (14.48±9.52 and 11.52±8.39, respectively, P < .05).

There was not any significant relationship between EAT-26 score with fathers' and mothers' literacy or job, birth order, family size, and family income.

Self-perception of body weight

In response to question: How is your weight for now? 3.8%, 11.9%, 51.6%, 22.6% and 10.1% responded: very low, low, appropriate, high and very high, respectively. Mean of EAT-26 was significantly different between above responses (F (5, 1887) = 82.07, P = 0.001). In Table 4, these results together with distribution of disordered eating attitudes for each response are shown. 47.1% of students, who answered "very high" to above question, had disordered eating attitudes (X² = 188.7, df=4, P = 0.001).

In response to question: Are you satisfied with your current weight? 36.6% were satisfied, 40.6% were not and decided to decrease, 14.1% were not and decide to increase, and for 8.7% body weight was not important. Mean of EAT-26 and distribution of disordered eating attitudes was significantly different between above responses (F (4, 1887) = 80.0, P = 0.001 and X² = 126.53, df=4, P = 0.001, respectively). In Table 5, these findings are shown.

Table 1: Mean and standard deviation (SD) of EAT-26 subgroups in studied participants

EAT-26 subgroups	EAT-26 < 20		EAT-26 ≥ 20		P value ^a
	Mean	SD	Mean	SD	
Dieting*	5.2	3.97	17.68	5.55	0.001
Bulimia **	1.29	1.57	3.53	2.81	0.001
Oral control ***	2.25	2.42	4.92	3.75	0.001

a. Unpaired t-test.

*. Dieting defined as: Sum of items: 1, 6, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24, and 25.

**. Bulimia defined as: Sum of items: 3, 4, 9, 18, 21, and 26.

***. Oral control defined as: Sum of items: 2, 5, 8, 13, 15, 19 and 20. ⁽³⁴⁾

Table 2: Mean and standard deviation (SD) of EAT-26 and distribution of disordered eating attitudes in different age groups, Tabriz-Iran

Age groups (Years)	EAT-26		EAT-26 ≥ 20	
	Mean	SD	Number	Percent
14-15 (n=216)	11.83	9.01	41	19
15-16 (n=464)	12.38	8.96	88	19
16-17 (n=546)	11.76	8.76	88	16.1
17-18 (n=486)	11.03	7.82	68	14.0
18-19 (n=175)	11.49	7.11	30	17.1

With ANOVA and Chi-square tests, no significant differences between groups were found

Table 3: Mean and standard deviation (SD) of EAT-26 and distribution of disordered eating attitudes in different regions, Tabriz-Iran

Educational Re- gion	EAT-26		EAT-26 ≥ 20	
	Mean	SD	Number	Percent
1 (n=447)	11.22	8.23 ^a	69	15.4 ^a
2 (n=558)	12.85	8.85 ^b	118	21.1 ^b
3 (n=292)	10.99	8.65 ^{a, c, d}	41	14 ^{a, c, d}
4 (n=234)	11.41	8.75 ^{a, b, c, d}	39	16.7 ^{a, b, c, d}
5 (n=356)	11.33	7.68 ^{a, b, c, d}	48	13.5 ^{a, c, d}

With ANOVA and post-hoc comparisons, in each column, figures with different superscripts are significantly different ($p < .05$)

Table 4: Mean and standard deviation (SD) of EAT-26 and distribution of disordered eating attitudes in different responses to question: How is your weight for now?

Response	EAT-26		EAT-26 ≥ 20	
	Mean	SD	Number	Percent
Very Low (n=72)	13.42	7.03 ^a	12	16.7 ^a
Low (n=222)	9.95	6.71 ^b	19	8.5 ^b
Appropriate (n=969)	9.45	7.31 ^b	93	9.6 ^b
High (n=452)	14.01	8.95 ^a	102	24.0 ^a
Very High (n=189)	19.74	9.09 ^c	89	47.1 ^c

With ANOVA and post-hoc comparisons, in each column, figures with different superscript are significantly different ($P < .05$)

Table 5: Mean and standard deviation (SD) of EAT-26 and distribution of disordered eating attitudes in different responses to question: Are you satisfied with your current weight?

Response	EAT-26		EAT-26 ≥ 20	
	Mean	SD	Number	Percent
Satisfied (n=686)	9.16	7.8 ^a	53	8.4 ^a
Not satisfied and decide to decrease (n=764)	15.15	9.23 ^b	217	28.4 ^b
Not satisfied and decide to increase (n=264)	10.33	6.82 ^{a, c}	27	10.2 ^{a, c}
Body weight is not important (n=163)	8.84	6.66 ^{a, c}	13	8.0 ^{a, c}

With ANOVA and post-hoc comparisons, in each column, figures with different superscript are significantly different ($P < .05$)

Discussion

The study was carried out for estimating the prevalence of disordered eating attitudes in Tabrizian high school girls and to determining their relation to socio economical status. Tabriz is center of east Azarbaijan and is located in North West of Iran. Its population's ethnicity is Azarian. We used EAT-26 and questions on socio economical status for collecting data.

EAT-26 introduced as EAT-40 by Garner et al. [36] in 1979. The authors proposed its final version in 1982 [34]. Today EAT-26 is one of the most used questionnaires for estimating disordered eating attitudes. It has been used in many studies [9-19, 21, 25-33]. Persian version of EAT-26 has been validated [33]. In our study its reliability and validity confirmed in Azarian groups ($r=0.80$, $\alpha=0.76$).

In our study mean (and SD) of EAT-26 was 11.71 ± 8.48 and 16.7% of them had EAT-26 equal or higher 20. Our results are considerably less than Tehran study. In this study mean (SD) of EAT-26 in high school girl students was 14.43 ± 8.35 , and 21.6% of studied participants had EAT-26 ≥ 20 [33]. Tehran is center of Iran and is more developed than Tabriz. Additionally, cultural and ethnical diversity and influence of foreign cultures are more in Tehran than Tabriz.

Our results are less than neighboring Arabian countries. Two studies in Saudi Arabia showed that 19.6-24.6% of girl students had EAT-26 ≥ 20 [7, 8]. AL-Adawi et al. [9] in Oman and Eapen et al. [10] in the United Arab Emirates showed that 29.4% and 23.4% of girl students had disordered eating attitudes. In these studies, EAT-40 ≥ 30 was considered as cut off point.

Our results are somewhat higher than studies in Turkey and China [11, 12]. In these studies, 12.37% and 10.8% of studied participants had EAT-26 ≥ 20 . In turkey's study mean of age was higher than ours (21.5 years). Interestingly in this

study, 52.17% of vegetarian persons had EAT-26 ≥ 20 [11].

Our results also are less than studies in urban area of South Africa. In two studies in South Africa, up to 18.8% of girls had EAT-26 ≥ 20 [13, 14]. Despite of these studies, in one study in the rural community of South Africa, only 3% of participants had EAT-26 ≥ 20 [15].

Our results are in the range of Brazil studies [16, 17]. In two studies in the Brazil, 15.5 and 15.76% of studied girl students had EAT-26 ≥ 20 [16, 17]. Results of American and European countries, Japan and Israel are much dispersed. For example in the US, 23-26% [18, 19], Canada, 14% [20], England, 4.92-21% [21, 22], Italy, 13.7-15.8% [23, 24], Spain 12.3-13.1% [25, 26], Israel, 19.5 - 20.8% [28, 29] and Japan, 5.4-35% [30-32], had disordered eating attitudes. In these studies disordered eating attitudes, considered as EAT-26 ≥ 20 or EAT-40 ≥ 30 .

In our study 51.6% of students responded that their body weight is appropriate. In this group mean of EAT-26 was the lowest (Table 4). The prevalence of disordered eating attitudes was the highest in students who answered that their body weight is very high. This indicates impact of body weight on disordered eating attitudes. As mentioned conceptions on body weight has important role in beginning of eating disorders [1, 2]. In our study, 36.6% of participants were satisfied with their current weight (Table 5). Unlike our study, in the US studies on similar groups, 80% of participants were unsatisfied from their weight [2]. Our study showed that unsatisfaction from body weight is linked to eating attitudes test score.

Our study showed smoking effect on disordered eating attitudes. It has been shown that body weight concerns can lead to smoking [37, 38]. Smoking can affect on appetite and therefore on body weight, so it can be used in eating disorders for body

weight control [39]. It is remaining to clarify which is leading to another one, eating disorder or smoking.

In our study, early menarche was linked to disordered eating attitudes. This finding has been shown in other studies [2]. Early puberty is accompanying with menarche and can lead to pay more attention on own body weight. This phenomenon together with emotional and psychological changes can predispose one to eating disorders.

In our study, there was not any association between socioeconomic statuses, except for region of residence, with disordered eating attitudes. Results of studies in this field are controversy [4, 5, 10, 37, 40], and there is need to more studies to clarify the role of these factors on eating disorders.

Limitations

This study had some limitations. The study was a cross-sectional and had non-probability nature of the sampling. It was one stage and did not have clinical interview for clinical forms of eating disorders, such as anorexia nervosa, and bulimia nervosa. We did not assess body dissatisfaction as gap between current self body image with ideal body weight.

Conclusions

Our study showed that Persian version of EAT-26 has acceptable reliability and validity for using in Iranian populations such as Azarbaijani girl adolescents. Noticeable prevalence of disordered eating attitudes in our study is comparable with studies in other parts of the world. It seems that body weight concerns, early menarche, smoking, and some of socio economical factors have roles in disordered eating attitudes. It is necessary to give sufficient information about normal and abnormal eating attitudes for adolescent girls.

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