



## Research report

## Eating disturbances among adolescent schoolgirls in Jordan

Tamara Yousef Mousa<sup>a,\*</sup>, Hayder Abdullah Al-Domi<sup>b</sup>, Rima Hussein Mashal<sup>b</sup>, Musa Abdel-Khaleq Jibril<sup>c</sup><sup>a</sup> Department of Nutrition and Food Science, University of Jordan, Amman 11196, P.O. Box 960364, Jordan<sup>b</sup> Department of Nutrition and Food Science, University of Jordan, Amman 11942, Jordan<sup>c</sup> Department of Counselling and Special Education, University of Jordan, Amman 11942, Jordan

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## ABSTRACT

**Objectives:** Several studies indicated that the prevalence of eating disorders has increased among adolescent girls. The aim of the present study, therefore, is to investigate the occurrence and correlates of eating disorders among adolescent girls in Amman, Jordan. **Method:** A sample of 432 adolescent girls aged 10–16 years were recruited from public and private schools in Amman. Information was collected from adolescent schoolgirls through a socio-demographic data sheet, eating attitude test, body shape and eating habits questionnaires. **Results:** One third of participants had eating disorders, including bulimia nervosa (0.6%), binge eating disorder (1.8%) and eating disorder not otherwise specified (31%), however no anorexic cases were found. Findings also suggested that pubertal, familial and social variables were associated with eating disorders occurrence. **Conclusion:** Eating disturbances were prevalent among the present population sample. Participants have been more preoccupied with their body weight due to socio-cultural norms that are reinforced by media messages. Further research is needed to develop intervention programs to control eating disorders occurrence in Jordan.

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## Introduction

Several studies have indicated that young females and adolescent girls are often experiencing eating disturbances associated with weight concerns, particularly in Western and developed countries (Al-Subaie et al., 1996; Ho, Tai, Lee, Cheng, & Liow, 2006; Jones, Bennett, Olmsted, Lawson, & Rodin, 2001; Nobakht & Dezhkam, 2000). This pursuit for thinness is explained by the perception of female beauty with extreme thinness (Sweeting & West, 2002).

According to the American Psychiatric Association (APA, 2000), eating disorders (ED) are characterized by severe disturbances in eating behavior of the individual intended to control body weight and accompanied by distorted body image. Further, ED are diagnosed by the criteria of Diagnostic and Statistical Manual of Mental Disorders-fourth edition-text revision (DSM-IV-TR) and include two specific types: anorexia nervosa (AN) and bulimia nervosa (BN) (APA, 2000). Eating disorder not otherwise specified (EDNOS) and binge eating disorder (BED) categories are provided to code for disorders that do not meet full criteria for a specific ED (APA, 2000). Eating disorders became the third leading chronic illness among adolescent girls in the United States and other developed countries (World Health Organization [WHO], 2005)

such as Canada (Jones et al., 2001) and Norway (Götestam & Agras, 1995). Although it has been argued that ED are rare in non-Western communities in which plumpness is not stigmatized (Shuriquie, 1999), ED were documented in developing and Arab countries (Al-Subaie et al., 1996). For instance, the lifetime prevalence of AN and BN has been 0.9% and 3.2%, respectively among adolescent girls in Iran (Nobakht & Dezhkam, 2000). Similarly, a study has addressed the occurrence of ED in Saudi adolescent girls and stated that 19.6% of the girls had abnormal eating attitudes and 0.8% had AN (Al-Subaie et al., 1996). Approximately, 10% of normal weight female college students in Lebanon have desired to be thin, preoccupied with weight, taken laxatives and diet pills, engaged in strenuous exercise, avoided high caloric foods, fasted, binged and skipped meals (Afifi-Soweid, Kteily, & Shediak-Rizkallah, 2002).

In the Western society, being thin (the ideal of beauty) is highly rated because it symbolizes certain notions such as social acceptance and success. Nonetheless, non-Western populations including Arabs have been found to place value on plumpness; a sign of beauty, fertility and good health (Shuriquie, 1999). Jordan is a lower middle-income non-Western Arabic country that has undergone considerable social developmental changes associated with certain cultural changes that have affected the Jordanian cultural norms, particularly, those who live in Amman, the capital city which is the most urbanized city in Jordan (Alwan & Kharabsheh, 2006; Ministry of Environment, 2006). The cultural changes have led to a wide spread adoption of Western styles, habits and attitudes. These changes included a shift in the lifestyle from active to sedentary, and in the eating patterns from

\* Corresponding author.

E-mail addresses: [mousa\\_tamara@yahoo.com](mailto:mousa_tamara@yahoo.com) (T.Y. Mousa), [h.aldomi@ju.edu.jo](mailto:h.aldomi@ju.edu.jo) (H.A. Al-Domi), [rima@ju.edu.jo](mailto:rima@ju.edu.jo) (R.H. Mashal), [jibrilm@ju.edu.jo](mailto:jibrilm@ju.edu.jo) (M.-K. Jibril).

Mediterranean diet to fast food. The Mediterranean diet imitates the goals of the American Dietary Guidelines in which it promotes health and reduces the risk of major chronic diseases through diet and physical activity as compared to fast food diet (Truswell, 1999). This is because Mediterranean diet is high in desirable nutrients such as dietary fiber and vitamins and low in undesirable nutrients as cholesterol and saturated fats (Wahrburg, Kratz, & Cullen, 2002). On the other hand, fast food pattern is high in fats, added sugars and salt, as well as it displaces healthy foods from the diet including milk, cereals, fruits and vegetables (Schmidt et al., 2005). Moreover, Jordan has witnessed transformations in the modes of dress from long loose dresses to Western modern styles, which are more tight-fitting and revealing as well as mostly fit slim females, might have affected body image ideals of Jordanian females initiating preoccupation with their bodies. The combination of these factors of westernization has posed dietary changes in the Jordanian culture, increasing obesity probabilities and non-communicable diseases such as cardiovascular diseases and diabetes mellitus (Alwan & Kharabsheh, 2006), as well as changing the standards of beauty contributing to weight consciousness and preoccupation with thinness among Jordanian females.

The literature signified that adolescents could be at risk for a number of health problems including obesity and ED. This is attributed to changes in lifestyle of adolescents that affect their eating behavior (Story, Neumark-Sztainer, & French, 2002). Accordingly, ED usually emerge during adolescence due to physical changes of puberty in which females experience a gain in body fat (Abraham & O'Dea, 2001). Further, ED in adolescents are highly correlated with many factors such as individual, familial and socio-cultural variables (Gowers & Shore, 2001). It has been reported that individual variables as pubertal timing and negative body image (Gowers & Shore, 2001), as well as parental pressures towards thinness and negative family relations have influenced ED occurrence (Archibald, Graber, & Brooks-Gunn, 1999). Similarly, socio-cultural variables including socioeconomic status, exposure to thin media messages, westernization, and pressure from peers have increased the risk of ED (Eapen, Mabrouk, & Bin-Othman, 2006; Field et al., 2001).

To the best of the researcher knowledge, information on health status of adolescents and on ED among adolescent schoolgirls in Jordan is relatively scarce. Therefore, findings of the present study will provide a baseline data regarding ED for other researchers. In all, the current study was conducted in a selected group of adolescent schoolgirls in Amman, Jordan to discuss the occurrence of ED in a non-Western country, and to examine the risk factors that may predispose these disorders.

## Method

A cross-sectional study was conducted from February to March 2008 to assess eating disturbances among adolescent schoolgirls in Amman, Jordan.

### Human participants

The current population sample size was allocated according to the population of elementary adolescent schoolgirls from both public and private schools in Amman, for the year 2006/2007 (Ministry of Education [MOE], 2007). Using the population sample size equation provided by Oveson (2006), the estimated population sample size of the present study was 432 adolescent girls aged 10–16 years in the fifth through tenth grade. In this study, we preferred to include only girls due to the high prevalence of ED among females.

Of the 432 selected adolescent girls, 326 (75.5%) returned signed consent forms and agreed to participate in the study and

106 (24.5%) adolescent girls were considered non-participants. Of the 106 non-participants, 85% returned signed consent forms indicating parents' refusal of participation, where parents justified their refusal by reporting that their daughters have to miss some classes, 9.4% did not return their consent forms in which they forgot to bring it back signed, and 5.7% were absent on the day of the study due to being sick as reported by the principals of schools.

Participants were recruited from two public and two private schools to ensure representation from all socioeconomic status. Four private schools were contacted in which two of them agreed to participate in the study, and public schools were selected by MOE. The other two private schools justified their refusals by considering the research protocol impractical. Eighteen participants from each grade were randomly selected from class lists for participation. With the cooperation of the respective schools, all parents of participants gave a written informed consent. A set of constructed questionnaire forms were used to collect information regarding lifestyle and demographic data, eating and body image disturbances. Data was collected and reported in a confidential manner. The Committee of Higher Studies in the University of Jordan approved this study protocol.

### Validity and reliability

The questionnaire consisted of four parts: (1) lifestyle and demographic data sheet, (2) eating attitude test (EAT-26) (Garner, Olmsted, Bohr, & Garfinkel, 1982), (3) body shape questionnaire (BSQ-34) (Cooper, Taylor, Cooper, & Fairburn, 1987), and (4) eating habits questionnaire (EHQ) (Greenfield, Quinlan, Harding, Glass, & Bliss, 1987). The last three questionnaires were translated and checked by an Associate Professor of Psychology (Mental Health), The University of Jordan.

To assess the content validity, the questionnaire was revised by a Panel of Academics of Psychology, Nutrition, and Arabic literature. The Panel of Examinee of the MOE has also reviewed the questionnaire and their respected comments were taken into consideration. Further, to standardize the tools of assessment, to measure their reliability, and to meet the Jordanian cultural norms, a pilot study was undertaken. A pair of 15 adolescent girls from each of the two schools, one from a private school and another from a public school, aged 10–16 years in the fifth through tenth grade was randomly selected. Twenty-four students returned signed consent forms and agreed to participate in the study, six students were considered non-participants.

The estimated values of internal consistency and reliability of the translated EAT-26 and BSQ-34 scales were 0.78 and 0.88 in public schools, respectively, as well as 0.87 and 0.93 in private schools, respectively. Further, the internal consistency of EAT-26 for the population sample was 0.80, which was comparable to other findings (Garner et al., 1982; Ho et al., 2006).

### Procedure

Participants who had parental signed informed written consent were given an information sheet explaining the general background of the study and received a brief verbal explanation regarding the research objectives. Further, participants were interviewed in groups of eighteen students, where the researcher filled in the questionnaire.

Height and weight of participants were measured by the researcher using a beam balance scale. Height was measured with no shoes and light clothing, and was recorded to the nearest millimeter. The participant was asked to stand straight with head positioned in the horizontal Frankfurt plane, feet together, knees straight, and heels, buttocks and shoulder blades in contact with

the wall (Gibson, 1990). Weight was measured with no shoes and light clothing, and was recorded to the nearest 0.1 kg. The participant was asked to stand straight ahead unassisted in the center of the platform in which the scale was checked for zero balance before each measurement (Gibson, 1990). Body mass index (BMI) of participants was assessed using BMI for age percentiles (Centers for Disease Control and Prevention [CDC], 2007) and weight for height percentiles (Frisancho, 1990). In the current study, these two indicators were found to be significantly correlated ( $p < 0.001$ ). Therefore, BMI for age percentiles were used as an indication of BMI because it is a sensitive measure of weight status in adolescents.

#### Tools of assessment

Lifestyle and demographic characteristics of participants were obtained through a constructed questionnaire, which provided information on age, socioeconomic status, educational level and occupation of parents, marital status of parents, family and peers history of dieting and ED, influence by negative comments regarding body weight and by media messages. Age was categorized into three groups: 10.1–12 years, 12.1–14 years and 14.1–16 years, to account for the great variations in puberty.

Eating attitude test is a screening tool developed to detect eating disturbances in non-clinical settings, where a score of 20 or above indicates negative eating attitudes. The authors had described a factor structure for EAT-26 scale which consisted of dieting, bulimia and food preoccupation, as well as oral control (Garner et al., 1982).

Body shape questionnaire is used to assess body image dissatisfaction. This tool was tested and found to be valid by Cooper and colleagues. Dissatisfaction with body image is considered present at a score of 110 or above (Cooper et al., 1987).

Eating habits questionnaire is used to detect ED. It provides information on weight changes and concerns, bingeing, purging behaviors, engagement in strenuous exercise, ED history, and menstruation (Greenfeld et al., 1987). The identification of ED was evaluated using DSM-IV-TR criteria (APA, 2000).

#### Statistical analysis

Data was analyzed using the Graduate Pack SPSS 12.0 for windows 2003. Differences among participants were examined using analysis of variance (ANOVA) for continuous variables, and chi-square tests for categorical variables. Data is presented as means  $\pm$  standard deviation (SD) and frequency distributions. The degree of internal consistency of ordinal scales was determined using Cronbach's alpha statistics. Linear regression models were used to examine the association between eating attitudes, and body image perceptions and other indicators of ED. To control for the influence of confounding variables, multivariate regression models were performed. Relative risk (RR) was estimated using  $2 \times 2$  table cross-tabulations and reported as odds ratios with 95% confidence interval (CI). All two-tailed  $p$  values of less than 0.05 were considered significant. Factor analysis followed by oblique rotation was performed for EAT-26, and items with factor loadings of 0.4 or above were reported. The extracted factors were determined by examining eigenvalues (more than one) and by scree test (Garner et al., 1982).

#### Results

General characteristics of the population sample are presented in Table 1.

**Table 1**

General characteristics of the population sample.<sup>a</sup>

Indicator	Participants (N = 326)
Age (years)	12.9 $\pm$ 1.8
Age of menarche (years)	12.4 $\pm$ 1.1
Weight (kg)	48.9 $\pm$ 12.6
Height (m)	1.5 $\pm$ 0.1
BMI (kg/m <sup>2</sup> )	20.9 $\pm$ 3.8
Post-menarcheal girls	186 (57.1)
Eating disturbances	
Binge eating (BE)	55 (16.9)
Self-induced vomiting (SIV)	36 (11)
Substance abuse (SB)	24 (7.4)
Eating disorders (ED)	
Eating disorder not otherwise specified (EDNOS)	101 (31)
Binge eating disorder (BED)	6 (1.8)
Bulimia nervosa (BN)	2 (0.6)
Anorexia nervosa (AN)	–

<sup>a</sup> Data is presented as means  $\pm$  SD and as frequency (%).

#### Negative eating attitudes

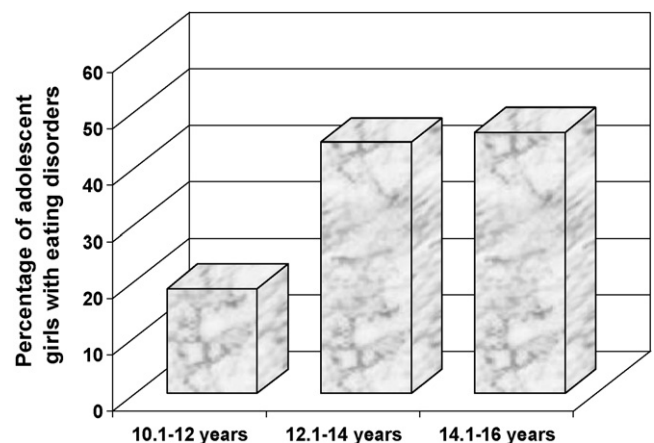
Mean EAT-26 score for participants was  $16.6 \pm 10.7$ . A maximum of 40.5% of adolescent girls scored at or above the cut-off point of EAT-26 indicating negative eating attitudes. Approximately, half of the population sample with negative eating attitudes developed body image dissatisfaction ( $p = 0.000$ ). Further, EAT-26 demonstrated that participants exhibited disturbed eating behaviors including binge eating (BE), self-induced vomiting (SIV) and substance abuse (SB) (i.e. laxatives, diuretics and diet pills) (Table 1).

Data obtained by linear regression model for EAT-26 showed a significant positive association for negative eating attitudes and BSQ-34 ( $\beta = 0.213$ ,  $p < 0.001$ ). A positive association was observed for negative eating attitudes and age, after controlling for BMI and BSQ-34 ( $\beta = 0.813$ ,  $p = 0.012$ ). Similarly, BMI showed a positive association with negative eating attitudes after controlling for age and BSQ-34 ( $\beta = 0.76$ ,  $p < 0.001$ ).

Additionally, factor structure analysis of EAT-26 produced seven factors: (1) weight concerns, (2) social pressures, (3) food preoccupation, (4) self-induced vomiting, (5) awareness of food content, (6) oral control, and (7) dieting.

#### Eating disorders

Using EHQ, 33.4% of participants had ED including BN, BED and EDNOS; however no cases with AN were identified (Table 1). Further, 0.6% of participants have been treated from an eating



**Fig. 1.** Eating disorders occurrence by age groups for the population sample.

**Table 2**  
Association between eating disorders and selected risk factors for the population sample.<sup>a</sup>

Indicator	Relative risk (RR) (odds ratios +95% CI)	
	Eating disorders (ED)	<i>p</i>
Being post-menarcheal	1.6 (1.4–1.9)	0.000
Being overweight or at risk of overweight	1.9 (1.4–2.6)	0.000
Parents marital status (having separated or widowed parents)	8.9 (1.9–40.7)	0.001
Having dwelling relatives	2.2 (0.99–4.8)	0.048
Make efforts to look like females in the media (media-1)	1.3 (1.1–1.4)	0.001
Exercise or go on a diet to lose weight because of a magazine article or picture (media-2)	1.5 (1.3–1.8)	0.000
Dieting history in friends	1.4 (1.1–1.9)	0.02
Dieting history in relatives	1.6 (1.3–2.1)	0.000
Eating disorders history in relatives	3.6 (1.2–10.4)	0.012
Eating disorders history in friends	3.9 (1.0–15.6)	0.032
Body image dissatisfaction (BSQ ≥ 110)	5.2 (3.3–8.4)	0.000
Negative eating attitudes (EAT ≥ 20)	3.3 (2.5–4.3)	0.000
Binge eating	16.3 (7.2–36.8)	0.000
Self-induced vomiting	15.9 (5.8–43.9)	0.000
Substance abuse	21.9 (5.3–91.4)	0.000

<sup>a</sup> Data is presented as RR (odd ratios +95% CI), and is considered statistically significant at  $p < 0.05$ .

disorder. Data in Fig. 1 shows that ED were significantly more prevalent among participants aged 12.1–14 years (44.4%) and 14.1–16 years (46.3%) than among adolescent girls aged 10.1–12 years (18.6%) ( $\chi^2 = 25.8$ ,  $p = 0.000$ ).

Relative risk for ED and selected risk factors are demonstrated in Table 2. Participants who had dwelling relatives [RR: 2.2 (0.99–4.8),  $p = 0.048$ ], and friends with ED history [RR: 3.9 (1.0–15.6),  $p = 0.032$ ] were significantly at higher risk to have ED. The likelihood of developing ED significantly increased among participants who had body image dissatisfaction [RR: 5.2 (3.3–8.4),  $p = 0.000$ ], who were post-menarcheal [RR: 1.6 (1.4–1.9),  $p = 0.000$ ] and overweight or at risk for overweight [RR: 1.91 (1.4–2.6),  $p = 0.000$ ].

## Discussion

### Prevalence of eating disorders

The present study has investigated ED occurrence among adolescent schoolgirls aged 10–16 years in Amman, Jordan. Over the past decade, evidence has accumulated indicating that the prevalence of ED among adolescent and young females has increased dramatically in the world (APA, 2000; WHO, 2005). Our findings demonstrate that 40.5% of the present population sample has experienced negative eating attitudes.

Present estimates of exhibiting BE, SIV and SB are similar to those reported in studies on ED among adolescent girls in Iran (Nobakht & Dezhkam, 2000), Canada (Jones et al., 2001), Australia (Abraham, 2003) and United States of America (USA) (Williams, Schaefer, Shisslak, Gronwaldt, & Comerchi, 1986).

Results of this study concluded that ED occurrence in the present population sample (33.4%) using DSM-IV-TR diagnostic criteria (APA, 2000) is higher than that observed in both Western and non-Western populations. For instance, in non-Western communities the prevalence of ED among adolescent girls was 19.6% in Saudi Arabia (Al-Subaie et al., 1996), 23.4% in the United Arab Emirates (UAE) and 29.4% in Oman (Eapen et al., 2006).

Additionally, the estimates of ED in adolescent girls were 7.4% in Singapore (Ho et al., 2006), 24.2% in Iran (Nobakht & Dezhkam, 2000), 18.6% in Nigeria and 29% in India (Al-Subaie et al., 1996). Several epidemiological studies also signified that ED occurrence in Western and developed countries such as Norway was 8.7% (Götestam & Agras, 1995), 12% in USA (Williams et al., 1986), 20% in Israel (Koslowsky et al., 1992) and 27% in Canada (Jones et al., 2001).

The Diagnostic and Statistical Manual of Mental Disorders (APA, 2000) verified that BN estimate was 1–3% which is higher than BN prevalence in this study (0.6%), nonetheless BED estimate of the current study (1.8%) is within the diagnostic BED estimate (0.7–4%).

In the present study, BN prevalence is lower than the estimates reported in Egypt (1.2%) (Shuriquie, 1999), Iran (3.2%) (Nobakht & Dezhkam, 2000), United Kingdom (1.3%) (Whitehouse & Button, 1988) and Norway (1.6%) (Götestam & Agras, 1995). Nevertheless, BN estimate of our study is higher than that observed in UAE (0.2%) (Eapen et al., 2006) and Pakistan (0.2%) (Mumford, Whitehouse, & Choudry, 1992). The prevalence of BED in the current study is lower than that in Norway (3.2%) (Götestam & Agras, 1995) and higher than that in France (0.7%) (Basdevant et al., 1995). Moreover, EDNOS occurrence in the present population sample is higher than that documented among adolescent girls in Iran (6.6%) (Nobakht & Dezhkam, 2000) and USA (26%) (Mizes & Sloan, 1998).

Generally, Jordanians are exposed to sudden changes in lifestyle patterns due to the socio-developmental changes that are characterized by shifting towards an urban life. These changes would cause adolescent girls to adopt some negative attitudes to go along with the modernization process of this period such as engaging in aberrant eating attitudes and behaviors to control body weight.

Over all, differences in the occurrence of ED in Western and non-Western populations might be explained by the fact that these studies were conducted in various communities, which reflects different cultures, ethnicities and socioeconomic status, as well as discrepancy in design and methodology used by the researchers, mainly sampling procedure and population sample characteristics.

### Risk factors of eating disorders

Findings of this study show that age and BMI were predictors of negative eating attitudes which are consistent with some studies that examined the risk factors of ED in adolescent girls (Eapen et al., 2006; Jones et al., 2001). In addition, the risk of developing ED among participants who were overweight or at risk for overweight has increased by almost 2 folds ( $p < 0.01$ ). Al-Subaie and colleagues (1996) reported insignificant relationship between ED and BMI. This is not supported by a study conducted in UAE, which demonstrated that heavier adolescent girls have significantly exhibited ED ( $p < 0.05$ ) (Eapen et al., 2006). Eating disorders in the present study were more pronounced among the age categories of 12.1–14 years and 14.1–16 years, that is among participants who were older than 12 years which is close to the mean menarcheal age. The current data also verifies that post-menarcheal girls were significantly at higher risk to develop ED by 1.6 folds ( $p < 0.05$ ). A previous study is consistent with the present findings stating that post-menarcheal girls exercised more and tried not to eat between meals to lose weight than pre-menarcheal girls (O'Dea & Abraham, 1999).

Earlier review on pubertal changes and ED argued that physical changes associated with puberty have predisposed bodies of post-pubertal girls to deviate from the pre-pubertal thin body considered ideal (Abraham & O'Dea, 2001; Sweeting & West, 2002). The discrepancy between actual and ultra-slender ideal

weight has a psychological impact on adolescent girls characterized by an exaggerated concern about weight (Moses, Banilivy, & Lifshitz, 1989), initiating ED development (Gowers & Shore, 2001).

Moreover, receiving negative comments regarding body weight from peers or friends [RR: 1.4 (1.1–1.7),  $p = 0.005$ ] and from parents [RR: 1.5 (1.2–1.8),  $p = 0.000$ ] have significantly increased the probability of developing ED. Nevertheless, numerous studies have indicated that perceived pressure to be thin and the importance of thinness to peers is not associated with weight concerns (Button, Loan, Davies, & Sonuga-Barke, 1997; Field et al., 2001). On the contrary, subsequent surveys are in accordance with the current findings verifying that negative comments from peers and parents regarding physical appearance have negatively influenced eating attitudes and behaviors of adolescent girls ( $p < 0.05$ ) (Archibald et al., 1999; Gowers & Shore, 2001; Taylor et al., 1998).

Exhibiting ED in the present study is significantly influenced by thin media images and articles on weight ( $p < 0.01$ ). Several studies are consistent with the current relationship between mass media and ED occurrence (Andersen & DiDomenico, 1992; Eapen et al., 2006; Field et al., 1999). The present data is comparable to a report which documented that adolescent girls aged 9–14 years, who made efforts to look like females in media have been 1.9 and 1.6 folds more likely to have weight concerns and to become constant dieters, respectively ( $p < 0.05$ ) (Field et al., 2001). In Jordan, females have internalized Western body ideals because of the accessibility to assimilate Western values through mass media. In particular, the changes in female beauty standards and body shape have been imported from the Western society through television programs, magazines and Internet. In addition, media messages promise to transform the body shape of females into a more desirable one and to lose weight easily in a short period of time by using non-nutritious diet products. These messages from media have caused Jordanian females, especially adolescent girls who seek media for information, to be dissatisfied with their body image and to engage in negative eating attitudes.

The present population sample who lived in a disturbed eating environment such as having friends or relatives with a dieting or ED history has significantly exhibited ED ( $p < 0.05$ ). The current findings are supported by previous studies demonstrating that adolescent girls who live in a dieting and/or ED environment are more likely to develop ED (Eapen et al., 2006; Levine, Smolak, Moodey, Shuman, & Hessen, 1994).

Extreme manifestations of disturbed eating behaviors including BE, SIV and SB among the present population sample are significantly associated with ED occurrence ( $p < 0.001$ ). Acknowledgment of negative eating attitudes and being dissatisfied with body image have also increased the risk of developing ED among the participants by 3.3 and 5.2 folds, respectively ( $p < 0.001$ ). Studies have demonstrated that negative body image perception (Eapen et al., 2006; Moses et al., 1989) and engaging in aberrant eating attitudes have significantly influenced ED occurrence in adolescent girls ( $p < 0.05$ ) (Abraham, 2003; Nobakht & Dezhkam, 2000; Williams et al., 1986). Further, a study has reported that the risk of engaging in dieting has significantly increased by 1.5 folds among American adolescent girls who exhibited BE ( $p < 0.05$ ) (French, Story, Downes, Resnick, & Blum, 1995).

The emotional climate of the family as having widowed or separated parents has influenced the risk of ED occurrence by almost 9 folds ( $p < 0.01$ ). Several studies are consistent with the present findings signifying that negative family environment has contributed to ED in adolescent girls (Archibald et al., 1999; Byely, Archibald, Garber, & Brooks-Gunn, 2000; Gowers & Shore, 2001). Results of the current study also support a previous report verifying that stressed family environment have significantly

increased the risk of dieting in adolescent girls by almost 1-fold ( $p < 0.05$ ) (French et al., 1995).

Furthermore, participants who had dwelling relatives are at higher risk to develop ED by approximately 2 folds ( $p < 0.05$ ). This might be attributed to that social environment and interpersonal processes within the family and with relatives have a substantial impact on the adolescent eating behavior through modeling, reinforcement, and perceived norms (Gowers & Shore, 2001; Story et al., 2002). In the Jordanian community in particular, some families have dwelling relatives who might interfere with the lifestyle of family members such as with their eating behavior, which could attribute to ED development. Further investigation, however, is required to embark on specific factors involved in this phenomenon.

Socioeconomic status is not associated with ED in the present study. Some studies are inconsistent with these findings arguing that high socioeconomic status has significantly contributed to eating problems development ( $p < 0.05$ ) (Ho et al., 2006; Jones et al., 2001). Several studies nevertheless, have supported the current data stating that adolescent girls with high socioeconomic status are not at risk to develop ED (Al-Subaie et al., 1996; Eapen et al., 2006). The present findings may verify that pervasive influence of mass media and societal pressures for thinness has predisposed ED experienced by adolescent girls across all socioeconomic status levels (Jones et al., 2001).

#### Factor structure of EAT-26

Interestingly, the current study has signified that EAT-26 consists of seven factors, which is consistent with a study conducted in Saudi Arabia using the Arabic version of EAT-26 (Al-Subaie, 1998); however, this did not meet Garner et al. (1982) findings. This discrepancy could be attributed to cultural and ethnic differences between the Arabic and Western societies, as well as to the higher socioeconomic status in Western and developed countries. Compared with adolescent girls in the West, therefore, the present population sample exhibited different and specific forms of negative eating attitudes. Moreover, the current results are inconsistent with others (Koslowsky et al., 1992; Mumford et al., 1992) who had found four factors for EAT-26 different from those reported by Garner and colleagues (1982).

The present study has few limitations: the researchers were not able to undertake a clinical diagnosis by a psychiatrist, given the limited resources, therefore, we could not know the number of participants who might have mental illnesses as obsessive compulsive disorder. Nonetheless, according to schools medical records, no adolescent girl has been found to suffer from any mental illness. Additionally, the absence of cases with AN among the present population sample might be related to the large number of refusals. However, based on the justifications reported by non-participants, no one was found to be related to ED.

#### Conclusion

In contrast to an earlier indication that ED are rare in non-Western communities in which plumpness is not stigmatized (Shuriquie, 1999), the present findings support the contention made by a recent research arguing that adolescent girls in developing and non-Western countries as Jordan would experience weight and shape concerns similar to that in Western populations (Eapen et al., 2006). Furthermore, the current data has illustrated that pubertal, social and familial variables are important indicators of disordered eating behaviors in a non-clinical population sample.

Well-controlled prospective and case-controlled studies of ED in adolescent populations in Jordan are pivotal to understand the

magnitude of these disorders in different socio-cultural areas in Jordan. Further research is also needed to develop intervention programs to prevent or decrease the occurrence of ED among adolescent schoolgirls in Jordan. The MOE is encouraged to develop educational programs targeting eating behaviors of adolescents, highlighting the importance of healthy eating patterns and the consequences of ED in the school curriculum as well.

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