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**PREVALENCE OF DIETING, OVERWEIGHT, BODY IMAGE SATISFACTION
AND ASSOCIATED PSYCHOLOGICAL PROBLEMS
IN ADOLESCENT BOYS**

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Abstract

Background: Dissatisfaction with body weight and the use of unhealthy weight reduction practices has been reported among adolescents. It is important to conduct rigorous studies using large representative samples of adolescents to assess accurately the dieting frequency, overweight and eating disorders and attitudes.

Objective: The aim of the present study was to examine the severity of dieting and its association with obesity, body satisfaction and psychological problems in adolescent boys.

Subjects: A representative sample of 800 boys in the age group of (14 –19) years were approached during the period from October to December, 2004 and 593 boys gave consent to participate in this study, thus giving a response rate of 74.1%.

Methods: Self-reports were obtained from 593 teenage boys using the Adolescent Dieting Scale (ADS), and the Self-Reporting Questionnaire (SRQ-20) for psychopathology.

Results: Of the studied subjects, 33.1% were overweight, 10.1% were extreme dieters and 37.4% were intermediate dieters. Among the dieters, 34% were overweight. Dieting was more likely in subjects who practiced exercise and who were perceived by peers or themselves as overweight. The extreme dieters experienced psychological problems than the intermediate dieters and non dieters. Extreme dieters reported sleeping problems (58.3%), tired all the time (53.3%) and felt like crying more than usual (50%). Television was the main source of information on diet (61.7%).

Conclusion: The present study findings provide a strong evidence for the association between frequent dieting and overweight, body image dissatisfaction and psychological problems.

Introduction

Adolescence is a time when social demands influence the individual and when “others” perceptions become very significant to the individual adolescent (Hill 1989). Capacity and competence in adolescent boys are complex issues, because adolescents have a tendency to make treatment decisions by themselves (Tan and Fegert 2004). Although dieting among boys are less common when compared to girls, some studies have shown the prevalence of eating disorders among boys cannot be taken too lightly (Braun *et al.* 1999). In complying with the demands of being socially attractive, dieting as a method of weight control has been a common behaviour particularly in Western culture and within particular groups such as adolescents (Swadi *et al.* 2000). While the definition of “dieting” includes weight-reduction efforts generally considered to be healthy (e.g., increased fruit and vegetable intake and decreased fat and sugar intake), many individuals also consider “dieting” to include unhealthy weight-control behaviours such as fasting, skipping meals, and eliminating food groups (Ackard *et al.* 2002, Brownell and Rodin 1994).

While dieting may be viewed as a useful exercise in body weight control, the occurrence of psychiatric symptoms in association with dieting seems to be an indication that dieting is not necessarily a healthy method of weight control, at least in some to support this view as recently highlighted by Patton (Patton *et al.* 1997) who found that psychiatric morbidity was clearly associated with extreme dieters reported high levels of depression and anxiety.

There are issues of concern over the practice of dieting among boys. First, many of the adolescent boys who dieted are of normal weight for their height, yet they use unhealthy weight-control behaviours such as fasting and use appetite suppressants, rather than healthier weight-loss practices such as reducing intake of fat and sweets and increasing physical activity (Ackard *et al.* 2002). Usually, adolescents are using unhealthy weight-control measures (Neumark-Sztainer 1999).

While dieting efforts among average weight or underweight individuals are most often considered negative, dieting efforts among overweight individuals have been viewed more positively (Ackard *et al.* 2002). For example, Wing and Jeffery (Wing and Jeffery 1999) found that among overweight individuals, modest weight reduction (10-15% of individual body weight) achieved by the combination of calorie reduction and exercise implementation were associated with positive changes in cardiovascular risk factors. Despite a large body of literature on emotional and behavioural factors associated with dieting, we are unaware of any studies that have looked at these associations independent of body mass index (BMI).

Dieting as part of an eating disorder has been well documented and accepted in Western culture, but it was only recently that eating disorders began to be viewed as cross-cultural phenomena with reports of clinical eating disorders in the Arab World (Hill 1989, Swadi *et al.* 2000).

To our knowledge, no studies reported the prevalence of obesity or dieting behaviour among adolescent boys neither in Qatar nor in the region. The aim of the present study was to examine the severity of dieting and its association with obesity, body image satisfaction, and psychological problems in adolescent boys in the State of Qatar.

Methods

Qatar, independent state occupying the Qatar Peninsula, jutting into the Persian Gulf from the eastern coast of the Arabian Peninsula. On its southern side it is bordered by Saudi Arabia. Qatar has an area of 11,493 Sq. Km. The land is stony and largely barren. An extremely hot, arid climate prevails. Humidity is high during the summer, but the annual rainfall is scarce. The population of Qatar is 724,125 (Annual Health Report 2003) and 30% of the total population constitute Qatari nationals.

A representative sample of 800 adolescent boys aged 14-19 years was included in this study. The study was conducted from October to December 2004. The population were derived from secondary and high schools in Qatar. A

multi-stage stratified sampling design was developed. In order to secure a representative sample of the study population, the sampling plan was stratified with proportional allocation according to stratum size. The sample size was determined with the a priori knowledge that the prevalence rate of dieting in the State of Qatar is more or less similar to UAE and Western countries; or that it may be affected by parity, heredity, climate and socio-demographic and environmental factors. Allowing an error of 2.5% and level of significance (Type-1 error) of 1%, it was believed that a sample size of 800 is adequate to achieve a high degree of precision in estimating the true prevalence rate of dieting in the general population. Schools were then selected according to geographical location. Of the schools selected, half of the classes were chosen (e.g. 5A, 5C, 5E...6A, 6C, 6E etc.). In those classes, half of the students were chosen on the basis of alternate names according to the class registration list. A total of 800 boys were approached and 593 expressed their consent to participate in this study. Two hundred and seven boys were excluded from the study due to incomplete questionnaire or did not give their consent or did not want to respond to the questionnaire due to lack of time.

Instruments

Self reports were obtained by using Adolescent Dieting Scale (ADS) (Patton *et al.* 1997) and Self Reporting Questionnaire (SRQ-20) (El-Rufaie and Absood 1994) for psychopathology. Questionnaire including the general demographic variables and dieting information was filled out by the Research Assistants. The anthropometrics measures of adolescent boys were measured and collected by qualified nurses.

1. The Adolescent Dieting Scale (ADS) (Patton *et al.* 1997). The Adolescent's Dieting Scale (ADS) consists of 8 items and for each question; there are 4 possible answers "seldom or never, sometimes, almost, always". They attracted a score of 0,1,2,3 respectively. The ADS is based on a refinement of a number of other scales for measuring dietary restraint. The authors identified

behaviours typical of dieting but did not include the extreme weight control strategies that are characteristics of clinical eating disorders. They identified nine behaviours, which covered three broad dieting strategies (calorie counting, reducing food quantity and meal skipping). The unidimensionality of the ADS was assessed by using a principal component analysis which showed that, for the nine item scales, there were two main components, one with an Eigen value of 5.4 and another with a much smaller Eigen value of 1.2. However, they found that one of the items “skipping breakfast” has a low item correlation and therefore carried out a separate analysis without that item. The alpha co-efficient for the eight items scale was 0.83 and it had two principal components with an Eigen value of 3.5 and the other component had a Eigen value of 1.0. On that basis, they considered the 8-item ADS a suitable scale for measuring dieting in a non-clinical population. Three bands of dieting in a non-clinical population. Three bands of dieting, minimal (total score 1-6, intermediate (total score 7-14) and extreme (total score more than 15) were identified using data obtained from their study.

Because of the ease of administration, the feasibility of quantification of dieting and understand ability and acceptability of this questionnaire, we decided to use it in our survey. Moreover, it seems to be culture free since it inquires about specific behaviours rather than concepts, which may be influenced by cultural factors. We therefore did a translation into Arabic with back- translation by a non-clinician who was fluent in both Arabic and English. We piloted the questionnaire on a small number of adolescents who reported that the questionnaire was understandable and easy to answer. There were minimal changes in the wording following the piloting process. For the above reasons, we did not feel that a full validation study of the ADS in this culture was not necessary and was not carried out.

The Arabic Version of the Self Reporting Questionnaire (SRQ) (El-Rufaie and Absood 1994). This is a screening instrument for identifying potential psychiatric cases in community settings and is not designed for diagnostic

purposes. The original version (Harding *et al.* 1980) consists of 20 items designed to detect non-psychotic symptoms. Each item would attract a score of 1 for a 'yes' response and 0 for a 'no' response . It has been found to have a fairly good sensitivity and specificity and has been successfully used in adolescent populations (Feijo *et al.* 1997). El Rufaie & Absood (El Rufaie and Absood 1994) validated the SRQ- 20 in a primary care sample in the United Arab Emirates and found it to be a valid instrument for detecting minor psychiatric morbidity.

BMI was calculated as the weight in kilograms (1 kg subtracted to allow for clothing) divided by height squared in meters. Subjects were classified into 3 categories: acceptable weight (BMI < 25 kg/m²); overweight (BMI 25–29.9 kg/m²); and obese (BMI 30+ kg/m²) (Garner 1993).

Statistical Methods and Analysis

The Statistical Package for Social Sciences (SPSS) (Norusis 1997) was used for statistical analysis. Data were expressed as mean and standard deviation (SD) unless otherwise stated. Student-t test was used to ascertain the significance of differences between mean values of two continuous variables. Chi-square analysis was performed to test for differences in proportions of categorical variables between two or more groups. In 2 X 2 tables, the fisher's exact test (two tailed) replaced the chi-square test if the assumptions underlying chi-square violated , namely in case of small sample size and where the expected frequency is less than 5 in any of the cells. One-way analysis of variance (ANOVA) was employed for comparison of several group means and to determine the presence of significant differences between group means of continuous variables. The level $p < 0.05$ was considered as the cut-off value for significance.

Results

A total of 593 of 800 enrolled school boys participated in this study, thus giving a response rate of 74.1%.

Table 1 shows the socio-demographic characteristics of the studied subjects. The mean BMI for the studied population was 23.2 (SD 3.9) (with range of 15.6 to 34.0). Of the total respondent population, BMI calculation showed that 196 (33.1%) fell above the 25 Kg/M². But, among the dieters, 34% were overweight.

Table 2 shows the Adolescent Dieting Score and BMI by age group. Only a small minority of the adolescent boys were non-dieters (11.8%). Almost 90% were dieting mostly on a minimal or moderate basis. However, 10.1% were extreme dieters. The prevalence of dieting did not show great variations in the two age groups of 14-16 years and 17-19.

Table 3 shows the comparison of dieting severity by Adolescent Dieting Scale. Among the overweight boys, 49% were dieters. Extreme dieting was higher among the subjects whose family members practiced dieting, however no significant difference was found. Dieting was most likely to be practiced among subjects who had a family history of arthritis (P=0.008) and heart disease (P<0.001). Dieting was clearly associated with exercise showing that those who diet more often also practiced exercise regularly (P=0.002). Self perception and peers perception of body weight also contributed heavily to the boys ADS score (P<0.001) in both cases.

Table 4 shows the association between the dieting behaviour and psychological factors in studied adolescent boys. Television and Magazines were the main sources of information for the extreme dieters on dieting and have shown a significant association. About 23.3% of extreme dieters got their information on dieting from school friends compared to 12.5% of non dieters and 18.9% of intermediate dieters (P=0.037). Television was the main source of information on diet for all subjects and again the extreme dieters were more influenced by the information through television (61.7%). The self-reported questionnaires revealed that poor appetite (45%) was more common among the extreme dieters. The other significant psychological problems among the extreme dieters were that sleeping problems (58.3%) and feeling tired all the time (53.3%), crying more than usual (50%).

Discussion

The rate of overweight among children continues to increase in every society. Overweight and distorted body perception can both lead to serious physical and psychological problems (Strauss 1999). Specific risk factors of eating disorders are body dissatisfaction, low self esteem, high need for social approval and history of physical abuse among adolescents (Garner 1993). It is interesting to point out that their actions are focused on diet without paying much attention to other aspects of life style including physical activity and even psychosocial problems.

There are very few studies on dieting and eating behaviour conducted in other Arab countries. Two relevant studies have been recently carried out, but their main focus was on obesity. Both studies indicated that a significant proportion of males (adults and adolescents) were overweight. First, Musaiger (Musaiger *et al.* 2003) found that 17.1% of male students were overweight and 8.4% were grossly obese. More recently, a cross-sectional study (Bener and Kamal) involving a sample of 8566 secondary and high school students boys aged 14 to 19 years found that 11.9% of boys were at a risk of being overweight. The rate reported in our study was higher than these studies that 33.1% of the adolescent boys were overweight. But, the overweight rate of Qatari adolescent boys were very similar to the rate found in a study of Fonseca (Fonseca *et al.* 2002) that the proportion of overweight individuals among boys (BMI greater than 90th percentile of the Brazilian population) was 23.9%.

Of the studied adolescent boys in the current study, 37.4% were intermediate dieters and 10.1% were extreme dieters which is quite higher than the rate found in an Australian study (Patton *et al.* 1997) that 12% of boys and 38% of girls were categorized as "intermediate dieters" and 1% of boys and 7% of girls were extreme dieters". Despite differences in methodology, several Western studies indicated that dieting (of varying severity) is a common behaviour even among young people of normal weight range. Wooley and

Wooley (Wooley and Wooley 1984) estimated that 72% of adolescents and young adults were dieting.

A research (Xie *et al.* 2003) done by the Institute for Health Promotion and Disease Prevention in California documented that perceived overweight boys and girls were more likely to experience anxiety and depression than perceived normal and underweight subjects. In our study, half of the extreme dieters had significant psychological problems like crying more than usual (50%), sleeping problems (58.3%) and feeling tired all the time (53.3%).

Environmental influences particularly peer group's perceptions and attitudes, role models and learned behaviour seem to be influential in this respect. The mass media are believed to encourage girls to form unrealistically thin body ideals (Field *et al.* 1999), but their impact on boys has not been investigated earlier. A study from Portugal (Fonseca *et al.* 1998) also reported that among boys the main factors for dieting were parental supervision and body mass index. Also a report from Latin America (McArthur 2001) found that the adolescents are very interested in learning more about obesity and weight loss methods.

A study on Body weight perception among Bahraini adolescents (Al Sendi 2004) revealed a significant discrepancy between adolescents' perception of body weight and actual BMI. There was a tendency for teenagers to underestimate their weight status, which was especially noteworthy among the overweight and obese. One third of the adolescent boys thought that their parents and their peers, respectively, could consider them to be overweight or obese. Data revealed in our study that self perception and peers perception of body weight also contributed heavily to the boys ADS score ($P < 0.001$) in dieters. But, Steen (Steen *et al.* 1996) reported in their study that the obese boys perceived themselves to be less overweight and happier with their looks than obese girls.

The use of problematic weight loss tactics were significantly higher among students who are involved in substance misuse reported by several studies (Garry *et al.* 2003, Durant *et al.* 1999). We have not covered these factors in our

study. Weight concerns develops among girls in all weight spectrum but among the boys it is strongly related to body mass index (Field *et al.* 2001). On the contrary, our results showed that there is no association of dieting with body mass index. The only factors which contribute to start dieting among Qatari boys is self perception and peer's perception of their own figure.

Conclusion

The present study findings revealed a strong evidence for the association between frequent dieting and eating disorders, body image dissatisfaction and psychological problems in adolescent boys in Qatar. Half of the overweight boys were dieters. Extreme dieters were under stress like they felt like crying more than usual, could not sleep well and felt tired all the time. Special attention needs to be directed toward teenagers for educating them about a healthy weight, body image, nutrition and exercises using culturally appropriate materials.

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Table 1. Socio-demographic characteristics of the studied subjects by gender.

Variables	Dieters N=282 n(%)	Non Dieters N=311 n(%)	P value
Age (Years)			
14-16	119(42.2)	142(45.7)	NS
17-19	163(57.8)	169(54.3)	
Body mass index (Kg/m ²)			
≤25 Normal	186(66.0)	211(67.8)	NS
>25 Overweight	96(34.0)	100(32.2)	
Education			
Intermediate	111(39.4)	128(41.2)	NS
Secondary	171(60.6)	183(58.8)	
Living condition			
Excellent	63(22.3)	60(19.3)	NS
Above average	81(28.7)	82(26.4)	
Average	43(15.2)	63(20.3)	
Below average	39(13.8)	41(13.2)	
Poor	56(19.9)	65(20.9)	
No of siblings			
≤6	161(57.1)	180(57.9)	NS
>6	121(42.9)	131(42.1)	

NS=Not Significant

Table 2. Adolescent Dieting Score (ADS) and Body mass index by age group.

Age group	Non dieters ADS=0	Minimal dieters ADS=1-6	Intermediate dieters ADS=7-14	Extreme dieters ADS=15-24	BMI groups (Kg/M ²)	
					≤25	>25
14-16 N=261	32(12.3)	110(42.1)	98(37.5)	21(8.0)	171(65.5)	90(34.5)
17-19 N=332	38(11.4)	131(39.5)	124(37.3)	39(11.7)	226(68.1)	106(31.9)

Table 3. Comparison of dieting severity by Adolescent Dieting Scale

Variable	Non/Minimal Dieters ADS=0-6	Intermediate Dieters ADS=7-14	Extreme Dieters ADS=15-24	p value
BMI, Kg/M ² (Mean±SD)	23.1±4.0	23.4±3.9	22.6±3.3	NS
BMI group, Kg/M ²				
≤25	211(53.1)	140(35.3)	46(11.6)	NS
>25	100(51.0)	82(41.8)	14(7.1)	
Dieting in family				
Yes	155(49.7)	118(37.8)	39(12.5)	NS
No	156(55.5)	104(37.0)	21(7.5)	
Obesity in family				
Yes	241(52.6)	165(36.0)	52(11.4)	NS
No	70(51.9)	57(42.2)	8(5.9)	
Family history of diabetes				
Yes	188(51.6)	137(37.6)	39(10.7)	NS
No	123(53.7)	85(37.1)	21(9.2)	
Family history of high blood pressure				
Yes	169(53.1)	117(36.8)	32(10.1)	NS
No	142(51.6)	105(38.2)	28(10.2)	
Family history of Arthritis				
Yes	75(51.7)	46(31.7)	24(16.6)	0.008
No	236(52.7)	176(39.3)	36(8.0)	
Family history of mental disorders				
Yes	17(42.5)	15(37.5)	8(20.0)	NS
No	294(53.2)	207(37.4)	52(9.4)	
Family history of heart diseases				
Yes	75(46.3)	55(34.0)	32(19.8)	<0.001
No	236(54.8)	167(38.7)	28(6.5)	
Dieting friends				
Yes	165(51.7)	121(37.9)	33(10.3)	NS
No	146(53.3)	101(36.9)	27(9.9)	
Practice Exercise				
Yes	148(46.3)	131(40.9)	41(12.8)	0.002
No	163(59.7)	91(33.3)	19(7.0)	
Satisfied with own body				
Yes	215(55.6)	135(34.9)	37(9.6)	NS
No	96(46.6)	87(42.2)	23(11.2)	
Peer's perception of respondent's figure				
Overweight	67(40.4)	78(47.0)	21(12.7)	
Average	139(50.7)	111(40.5)	24(8.8)	<0.001
Underweight	105(68.6)	33(21.6)	15(9.8)	
Self perception of figure				
Overweight	107(44.4)	101(41.9)	33(13.7)	
Average	123(53.2)	87(37.7)	21(9.1)	<0.001
Underweight	81(66.9)	34(28.1)	6(5.0)	
SRQ (Mean±SD)	6.8±3.8	6.6±3.7	7.4±3.9	NS

Table 4. Association between dieting severity and psychological factors

Variable	Non/Minimal Dieters ADS=0-6 (n=311)	Intermediate Dieters ADS=7-14 (n=222)	Extreme Dieters ADS=15-24 (n=60)	p value
Source of information on dieting				
School	39(12.5)	42(18.9)	14(23.3)	0.037
TV	130(41.48)	107(48.2)	37(61.7)	0.014
Magazine	123(39.5)	93(41.9)	27(45.0)	NS
Radio	31(10.0)	28(12.6)	10(16.7)	NS
Often has headache	111(35.7)	88(39.6)	25(41.7)	NS
Has poor appetite	82(26.4)	58(26.1)	27(45.0)	0.009
Sleeping badly	146(46.9)	84(37.8)	35(58.3)	0.009
Are you easily frightened	111(35.7)	81(36.5)	24(40.0)	NS
Sometimes hand shakes	89(28.6)	62(27.9)	16(26.7)	NS
Feel tensed, nervous or worried	183(58.8)	116(52.3)	31(51.7)	NS
Poor digestion	67(21.5)	49(22.1)	22(36.7)	0.035
Having trouble thinking clearly	140(45.0)	87(39.2)	21(35.0)	NS
Feeling unhappy	101(32.5)	91(41.0)	18(30.0)	NS
Crying more than usual	104(33.4)	75(33.8)	30(50.0)	0.041
Difficulty in enjoying daily activities	93(29.9)	77(34.7)	22(36.7)	NS
Difficulty in making decisions	120(38.6)	90(40.5)	22(36.7)	NS
Daily work is suffering	110(35.4)	81(36.5)	17(28.3)	NS
Unable to play useful part in life	75(24.1)	47(21.2)	19(31.7)	NS
Lost interest in things	106(34.1)	77(34.7)	15(25.0)	Ns
Feeling worthless person	36(11.6)	31(14.0)	6(10.0)	NS
Thought of losing life in mind	78(25.1)	55(24.8)	20(33.3)	NS
Feeling tired all the time	156(50.2)	92(41.4)	32(53.3)	NS
Uncomfortable feeling in stomach	97(31.2)	56(25.2)	16(26.7)	NS
Easily tired	107(34.4)	61(27.5)	25(41.7)	NS