

## **Risk Factors Associated with Bulimia in Schooled Adolescents in Fez (Morocco)**

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### **Abstract**

**Background:** Bulimia is an eating disorder (ED) that mainly affects adolescents. **Objective:** To estimate the prevalence of bulimia among adolescent and it's associated risk factors. **Methods:** A cross-sectional survey was carried out on a representative sample of 367 students from colleges and high school degree both from the public and private. A self-questionnaire with items on socio-demographic characteristics, lifestyle and food was administered. The screening of ED was made using a specific Eating Attitudes Test (EAT-26). Depressive disorders were assessed by the Hospital scale Anxiety and Depression (HAD). Anthropometric measurements were carried out in a standard manner in all adolescents. **Results:** The mean age was  $15.58 \pm 2.01$  years with a range of [12-19]. The mean body mass index (BMI) was  $19.99 \pm 2.47$ . The prevalence of bulimia was 9.6% [CI 95 %: 6.8-17.3 %]. Bulimia prevalence was higher among girls comparing to boys (13,5% vs 5,3%,  $p < 0.007$ ). Associated factors to bulimia are: Being overweight (OR = 4.55 [95% CI: 1.15 – 20.00]  $p < 0.03$ ), the fear of gaining weight (OR = 14.01 [95% CI: 1.68-116.86]  $p < 0.015$ ) and the depression (OR = 42.76 [95% CI: 13.57 -134.75]  $p < 0.000$ ). The diet was the most widely used method of weight control in bulimic adolescents (40.8%). **Conclusion:** Bulimia is a frequent health problem in our context, undertaking a preventive strategy should be a priority for the local health policy makers.

**Keywords:** Adolescent, bulimia, prevalence, depression, Morocco.

## Introduction

Adolescence is triggered by puberty and considered a time of great changes mainly biological, psychological, cognitive and social. It is the main window of vulnerability for the onset of eating disorders such as bulimia.

Russell was the first to describe the "bulimia" in 1979, portraying it as a variant of the anorexia (Russell, 1979). In 1980, "bulimia" for the first time entered the DSM III as an independent diagnosis (American Psychiatric Association, 1980).

Bulimia is an eating disorder characterized by recurrent binge eating, compensatory behaviors aimed at reducing weight or weight gain, and obsessive preoccupation with body weight and shape (Timothy and Brewerton, 2002). During the binge cycle, individuals feel a loss of control over the rate and amount of food they are eating, and they consume a significantly larger amount of food than the average in a short period of time. The binges are thought to be instinctual and compulsive, and they typically trigger anxious feelings. As a result, there is a need to engage in drastic measures to remove the calories ingested. Such compensatory behaviors may include excessive exercising, self-induced vomiting, misuse of laxatives and/or diuretics, or fasting (American Psychiatric Association, 2013; Wattam et al., 2014).

The objective of our study was to estimate the prevalence of bulimia among adolescent in our region and to evaluate the risk factors associated with this disorder.

## Materials and Methods

1. **Study design and subjects:** This is a descriptive cross-sectional survey carried out during three months in 2015 on a random sample of 367 students of private and public secondary schools and colleges located in the city of Fez.
2. **Variables and data collection**
  - **The questionnaire:** A self-administered questionnaire was distributed to the study subjects in order to collect information on socio-demographic characteristics (gender, age, socioeconomic level, etc.), lifestyle and dietary habits (frequency of diets, purge, vomiting, Alcohol, nature of food consumed, snacks, etc.).
  - **Eating Attitudes Test:** The EAT-26 scale is a questionnaire includes 26-items allowing to evaluate symptomatology and The characteristic concerns of the eating disorders (ED) developed in 1982 by Garner et al, and validated in French (Leichner et al., 1994). Each participant responded to the 26 items by a scale ranging from 1 (always) to 6 (never), a total score obtained greater than or equal to 20 indicating eating disorders.
  - **Hospital Anxiety and Depression scale (HAD):** The HAD scale is an instrument used to screen anxiety and depressive disorders. It includes 14 items rated from 0 to 3. Seven questions relate to anxiety (total A) and seven others to the depressive dimension (total D), allowing thus obtaining two scores (maximum score of each score = 21). To detect anxiety and depressive symptoms, the following interpretation can be proposed for each of the scores (A and D):
    - 7 or less: absence of symptomatology.
    - 8 to 10: suspicious symptomatology.
    - 11 and more: symptomatology certain (Zigmond and Snaith, 1983) and validated in French (Lépine et al., 1985).
  - **Anthropometric parameters:** The anthropometric measurements were carried out in a standard manner at the same time as the questionnaire administration. The weight of the students (in kg) was evaluated using a SECA brand mechanical scale with an accuracy of 0.5 Kg. The size (in meters) was measured using a measuring rod Duralumin wall of brand SECA. These measurements were performed on barefoot and slightly dressed adolescents. From these measurements was calculated the body mass index (BMI).

3. **Organizational and ethical aspects:** After obtaining the authorization of the school responsible and the local academy of education, as well as the oral consent of the study participants, who were invited to complete to the questionnaire individually and in an anonymous way by explaining to them how to fill it.
4. **Statistical analysis:** The data collected was entered using the Excel tool and analyzed using the SPSS version 20 software. The quantitative variables were expressed in average and standard deviations, the qualitative variables in percentages. The comparison between the qualitative variables performed using the chi-square test. Binary logistic regression was used for multivariate analysis. The significance threshold was set at  $p < 0.05$ .

## Results

An overall of 367 students were included in the survey, including 189 girls (51.5%) and 178 boys (48.5%). The mean age was  $15.58 \pm 2.01$  years with a range of [12-19]. The mean body mass index (BMI) was  $19.99 \pm 2.47$ . The majority of the adolescents (91.1%) come from nuclear families and lives with their two biological parents. The HAD scale mean score was  $8.005 \pm 3.473$ .

### Prevalence of Bulimia and Associated Factors

The overall bulimia prevalence was estimated at 9.6% [95% CI: 1.2-6.1%]. In univariate analysis, the factors statistically associated with bulimia were gender ( $p < 0.01$ ), BMI ( $p < 0.001$ ), weight perception ( $p < 0.01$ ), perception of body image ( $p < 0.001$ ), and depression ( $p < 0.007$ ). Univariate analysis data are presented in Table 1.

**Table 1:** Factors associated with bulimia in schooled adolescents: Univariate analysis

	Bulimic		Not bulimic		P
	N	%	N	%	
<b>Sexe (n=354)</b>					
Boy	9	5.3	160	94.7	0.007
Girl	25	13.5	160	86.5	
<b>Matrimonial situation of the parents (n=346)</b>					0.122
Married	24	7.6	291	92.4	
Divorced	1	8.3	11	91.7	
Widowed	4	21.1	15	78.9	
<b>Socio-economic level (n=346)</b>					0.529
High	3	5.3	54	94.7	
Medium	15	10	135	90	
Low	11	7.9	128	92.1	
<b>BMI (n=354)</b>					0.000
Thin	7	9	71	91	
Normal	21	8	241	92	
Overweight	6	42.9	8	57.1	
<b>Perception of weight(n=345)</b>					0.003
Fear of gaining weight	12	9.1	120	90.9	
Desire to lose weight	20	16.1	104	83.9	
Desire to gain weight	2	2.2	87	97.8	
<b>Perception of body image(n=345)</b>					0.001
To be big	13	18.6	57	81.4	
Normal	16	6.7	224	93.3	
Thin	0	0	35	97.2	
<b>Depression(n=354)</b>					0.000
Absence of symptomatology	6	3.9	147	96.1	
Suspicious symptomatology	5	3.1	157	96.9	
Symptomatology certain	23	59	16	41	

### Multivariate Analysis of Factors Associated with Bulimia

After multivariate logistic regression, the following factors remained significantly associated with bulimia: the overweight (OR = 4.55 [95% CI: 1.15 – 20.00]  $p < 0.03$ ), the fear of gaining weight (OR = 14.01 [95% CI: 1.68-116.86]  $p < 0.015$ ) and the depression (OR= 42.76 [95% CI: 13.57 -134.75]  $p < 0.000$ ). Multivariate analysis results are shown in Table 2.

**Table 2:** Correlates of Bulimia in Moroccan adolescent: result of a Multivariate analysis using binary logistic regression

Explanatory Factors	OR adjusted	95% CI	P
Overweight	4.55	1.15 – 20.00	<0.03
Fear of gaining weight	14.01	1.68 – 116.86	<0.015
Depression	42.76	13.57–134.75	<0.000

### Weight Control Strategies

The diet was the most widely used method of weight control in bulimic adolescents (40.8%). Table 3 illustrates these data.

**Table 3:** Prevalence of weight control means in bulimic adolescents

	N	%
Diet	11	40.8
Laxatives	3	11.1
Diuretics	4	14.8
Appetite suppressants	4	14.8
Vomiting	5	18.5

### Discussion

The objective of this study was to estimate the prevalence of bulimia and to highlight the link with weight and body image dissatisfaction as well as depression in the appearance of this disorder in schooled adolescents in city of Fez.

The prevalence of bulimia is difficult to estimate against the big disparity of results. In our study, the prevalence of bulimia was 9.6% [95% CI: 1.2-6.1%], this prevalence was higher among girls comparing to boys. An Australian study conducted on 1943 adolescents reported a prevalence rate of 3.7 % with bulimia (Patton et al., 2008). However, another study in Spain found a prevalence of bulimia of 17.2% (Laporta-Herrero et al., 2016). In France, a study carried out on 328 adolescents of an age comparable to that of our sample (from 12 to 19 years old) leads to an estimation of 1 % with bulimia (Ledoux et al., 1991). In Morocco, Gazal.al (2001) found prevalence of 0.8 % bulimia with alone case of men within a population of 2044 among the high school students. This variability in prevalence may be justified by the uses of different screening strategies, sample size and cultural and societal differences.

Concerning the marital status and socioeconomic level of students, the results of our study did not show a statistically significant relationship between bulimia and these variables, these findings match were consistent with previous studies who found that bulimia was frequent at the adolescents pertaining to a lower or middle socioeconomic status (Gross and Rosen, 1988; Warheit et al., 1993). However, other studies revealed that the bulimia was significantly related to a high socioeconomic status (Timmerman et al., 1990; Szweda and Thorne, 2002).The psychosocial factors behind this phenomenon are to be explored. Also, compiling evidences from more studies is needed in order to

understand whether or not the association between bulimia and high socioeconomic level of life is a constant phenomenon regardless of culture and context differences.

In our study, a statistically significant association was found between BMI, weight perception and body image, depression and bulimia. This finding corroborates with those reported in the literature (Altabe and Thompson, 1992; Steiger et al., 1992; Mora-Giral et al., 2004; Abebe et al., 2011). This suggests that bulimics feel a fear of gaining weight and a negative view of their body image, it has a direct impact on their development and normal well-being. Bruch (1973) considered that it is impossible to cure a person with ED as long as the way she perceives her body is not changed.

The use of means to control weight in bulimic adolescents was quite common in our study (79.4%). Ghazal et al (2001) found a frequency in high school students, estimated at 52.9%. A survey conducted in France among 795 young people, showed that 18% of girls had fasting behaviors, 4% of boys and 11% of girls had vomiting and abuse of laxatives or diuretics (Ledoux et al., 1991). In our study diet is the strategy most used by bulimic adolescents in order to lose weight or prevent weight gain, while the use of (laxatives, appetite suppressants, diuretics, vomiting) was limited. These results are consistent with those reported by other authors (Ledoux et al., 1991; Yves Simon and François Nef, 2004; Herpertz-Dahlmann, 2009).

Our study has certain limitations, especially related to representativeness; in fact, adolescents in rural areas have not been included. However, we think that the urban was well represented by the random mode of sampling and stratification on gender and the social level represented by the public and private study sectors. Data collection using questionnaire also entails a risk of error concerning the accuracy of the latter, but the anonymity and the consent of the adolescents make us rather confident with regard to the accuracy of our results. The goal of the study is original because the topic approached in this paper is still vague and related data are lacking in our context; studies investigating this issue are few in fact. Morocco is currently experienced a food transition characterized by unhealthy change in the food behavior of people (El Rhazi et al., 2012) and special focus should be done towards adolescent health.

## Conclusion

The results of this study highlight the important rate of bulimia in schooled adolescents in the city of Fez. The study revealed that dissatisfaction with weight and appearances as well as depression are risk factors associated with bulimia. The consequences of this pathology would constitute very probably a problem of public health in Morocco. A good understanding of this pathology and its determinants associated with systematic screening would be an effective way of prevention in our context.

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