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Occurrence, sociodemographic, and clinical correlates of eating disorders among a sample of secondary school students in Egypt

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Abstract

Background: Eating disorders are common in adolescents. Data on occurrence rates, sociodemographic correlates, and risk factors in Egyptian population are needed along with better screening tools to inform future research and service development. We aimed to estimate the occurrence of eating disorders in a representative sample of Egyptian adolescent students and to examine the sociodemographic and clinical risk factors associated with eating disorders. So, a multistage random selection of 407 adolescent students from public and private secondary schools in Eastern Tanta, Egypt, was carried out. All participants were subjected to screening using the Eating Attitude Test (EAT) and the eating disorders section of the clinician version of the Structured Clinical Interview for DSM-IV axis-I disorders

Results: Occurrence estimates of anorexia nervosa and bulimia nervosa were 6.1% and 3.2%, respectively. Being female, overweight (BMI = 25–29.9 kg/m²), low self-esteem, and high body shape preoccupation were significantly associated with eating disorders risk among adolescents.

Conclusions: Eating disorders are prevalent in the general adolescent population. The unmet treatment needs in the adolescent population place these disorders as important public health concerns.

Keywords: Eating disorders, Anorexia, Bulimia, Correlates, Egypt

Background

Adolescence period is a life stage that is highly characterized by body image disturbances due to various physiological, cognitive, emotional, and social changes with a greater concern for physical appearance [1]. Previous studies revealed that adolescents are more susceptible to abnormal eating behaviors and eating disorders [2–5].

Contrary to eating disorders in adults, diagnosis and management of eating disorders is not such an easy issue

in children and adolescents as most of them do not usually meet the full criteria for eating disorder diagnoses [6]. Instead, adolescent age groups usually presented with subthreshold symptoms of eating disorders [7].

Ancient Arab culture regarded fatness as a sign of fertility and femininity for many decades [8]. Other literatures suggested that Egyptian society likes obese females and considers fatness as a symbol of adorableness [9]. These concepts were providing a protective umbrella against eating disorders for a while. However, with the rapid social changes and acculturation occurring in many of the Arab countries, the adolescents' behaviors and attitudes in these countries appear to be changing more towards Western values [10].

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Early identification of eating disorders among school students is crucial, as various studies have confirmed that teachers could be considered as a great aid to the prevention of such disorders, if they receive adequate training [11]. Teachers are hardly receiving training in healthy nutrition styles and eating disorder prevention techniques, so they usually show a great lack of knowledge as a barrier to implement eating disorder prevention programs at schools [12–14].

This motivated the research team to study the magnitude of such an underestimated problem in Egypt. The objectives of this study are to estimate the occurrence of eating disorders in a sample of secondary school students in the Eastern area of Tanta, Egypt, and to examine their associated sociodemographic and clinical risk factors.

Methods

Study design

This study is a descriptive, cross-sectional, school-based study.

Site of the study

This study was conducted in Tanta, Egypt. A sample of adolescent secondary school students in Tanta was drawn. According to statistical data for the academic year 2016/2017, which has been obtained from decision-making support and information center, statistical management of Gharbia Governorate, Tanta, is sectioned into Eastern and Western geographical areas; these areas have nearly equal number of students. The Eastern area was included in the study for its easier accessibility to the research team. In Eastern Tanta, both types of schools include totally 12,784 students, and governmental schools include 11,604 students (5955 males and 5649 females) while private schools include 1180 students (591 males and 589 females).

Calculation of sample size

The determination of the size of this sample was done after the consultation of a statistician. Stratified random sampling was used in this study sample size and was statistically calculated by considering the total society size = 12,784, error percentage = (0.05), percentage of availability of the character and objectivity = 70%, and the corresponding standard class of significance = 95%. Thus, the study sample must be not less than 407 according to the used equation of calculated sample size and it was allocated to ensure the suitability of the chosen sample to the total number of students: 300 students from governmental secondary schools and 107 students from private secondary schools.

From each type of the above-mentioned schools, stratification was done, where two schools were selected

by random sampling, then from each selected school, classes were selected also by random sampling, and from the selected class, students were also selected by simple random sampling. The study included students of both genders with an age range between 16 and 18 years and who were agreed to participate in the study. Students with a known history of psychiatric and/or medical disorders or a history of being maintained on any medications were excluded from the study.

Ethical consideration

The authors received the approval of the Ministry of Education before conducting the study procedures. In addition, a written informed consent was obtained from the school manager for all included students who approved to participate in the study. All subjects were informed about the questionnaires being used in the study and students who only agreed to share in the study were included. Interviews with the students were done at each school in private rooms that were determined by the school manager in order to ensure confidentiality. The study was conducted in accordance with the guidelines of the Research and Ethics Committee of the Institute of Psychiatry, Ain Shams University.

Procedure

The data were collected by direct interviewing of the students in suitable settings inside their schools during the academic year of 2016–2017. The students completed the following tools:

- 1- *Semi-structured clinical data sheet*: Semi-structured clinical data sheet is routinely used at Ain Shams University Institute of Psychiatry. It consists of sociodemographic data, including age, gender, education, and social status.
- 2- *Eating Attitudes Test (EAT40)*: The Eating Attitude Test (EAT) is the most widely used self-report test for screening large populations for attitudes and symptoms characteristic of eating disorders [15]. The recommended cut-off score is 30 and scores above or equal to 30 are frequently associated with abnormal eating attitudes and behavior [16]. An Arabic translated and validated version was used in this study [17]. The psychometric features of the Eating Attitude Test Questionnaire (EAT) are described in an Egyptian population of secondary school girls ($n = 351$) and pointed to the overall coherence of the EAT in this population [17].
- 3- *Arabic version of Eating disorder section of Structured Clinical Interview for DSM-IV (SCID I Clinical version)* [18]: It was used to confirm the diagnosis of axis-I psychiatric conditions and to detect various types of eating disorders. It was chosen

for relatively easier administration in a clinical setting. The Arabic translated and validated version of the Structured Clinical Interview for DSM-IV axis I Disorders (SCID-I) was used [18]. It was applied on candidates who were found positive on EAT-40 Scale (with EAT40 score ≥ 30).

- 4- *Body Shape Questionnaire-Revised-10 (BSQ-R-10)* [19] Arabic version [20]: The Body Shape Questionnaire (BSQ) is a widely used scale to assess body dissatisfaction. It has been found to be valid by Cooper and colleagues (1987) [21]. Its concurrent validity was established by the significant correlations between BSQ-34 (the original version) and the total score of EAT26 and Body Dissatisfaction subscale of Eating Disorder Inventory Questionnaire. It was administered to assess the degree to which one is preoccupied with the size and shape of one's body. Several short forms of the BSQ have been introduced. One of them is the BSQ-R-10, on which items are scored on a 6-point Likert scale, ranging from 1, never, to 6, always. The total scores range from 1 to 6, and higher scores indicate increased preoccupation with body shape [19]. the BSQ-R-10 was cross-validated in another sample of female adolescent students, and its psychometric properties were further supported. The Arabic translated and version was used in this study [20].
- 5- *Self-esteem Scale* [22]: The self-esteem scale is an Arabic self-reported questionnaire that was designed to measure the overall self-esteem of the reporter. It assesses the self-view of the reporter to his capabilities in different situations. It is composed of 30 items rated as follows: frequently = 2, sometimes = 1, and never = 0. Items indicating low self-esteem are inversely scored. Higher scores indicate higher self-esteem, and it was validated and standardized to be used in various age groups including adolescents [22]. Sociodemographic data were reported, and height and weight were measured for all students who agreed to participate in the study. Then, EAT40, BSQ-R-10, and Self-esteem Scale were administered for all students who agreed to participate in the study. Lastly, SCID-I was applied only for the students with EAT40 score ≥ 30 in private places that were determined by their school managers.

Statistical analysis

The collected data were statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 19, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean, and standard

deviation were calculated. Boxplots were performed to illustrate median and first and third quartiles of the quantitative data.

For qualitative data, which describes a categorical set of data by frequency, percentage, or proportion of each category, comparison between two groups and more was done using chi-square test (χ^2) and Fisher's exact test.

For comparison between means of two groups of parametric data of independent samples, Student's *t* test was used.

To predict the presence or absence of an outcome based on a set of predictor variables, binary logistic regression and multinomial logistic regression were done. For each of the independent variables, logistic regression coefficients (B) are calculated and used to estimate odds ratios (EXP (B)) for each of the independent variables as risk factors for eating disorders and its types among the studied secondary school students.

P value was considered significant when $P < 0.05^*$ and highly significant when $P < 0.001^{**}$.

Results

Sample characteristics

The study sample included 407 secondary school students: 207 were males (50.9%) and 200 were females (49.1%). The mean age for the studied sample was 16.05 ± 0.23 years, and they were distributed as 107 students (26.3%) from private schools and 300 students (73.7%) from governmental schools. Their body weight ranged between 34 and 130 kg with a mean of $65.06 \text{ kg} \pm 14.84$ (other sociodemographic and clinical data are shown in Table 1).

Results revealed that 83 students (20.4% of the study sample) were highly preoccupied with their body shape using the body shape questionnaire-revised-10 (BSQ-R-10) and that 14 students (3.4% of the study sample) were having a low level of self-esteem using the Self-esteem Scale.

The Eating Attitude Test scores among the studied sample ranged between 3 and 61 with a mean of 18.53 ± 9.25 . A percentage of 9.3% of the studied population were estimated to meet criteria for eating disorders according to the eating attitudes test (EAT) cut-off point.

Occurrence of eating disorders (diagnosed by SCID-1) and its types among the study sample ($n = 407$)

By the use of SCID-I, it confirmed that 9.3% of the studied population have been diagnosed with eating disorders, distributed as 13 students (3.2% of the total sample) were having anorexia nervosa and 25 students (6.1% of the total sample) were suffering from bulimia nervosa (Table 2).

Table 1 Sociodemographic and clinical characteristics of the study sample

Variables	Secondary school students (n = 407)	
	Range	Mean ± SD
Age, year	16–17.5	16.05 ± 0.23
Father's income	N	%
No income	1	0.2
Not enough	23	5.7
Enough	227	55.8
Enough and spare	156	38.3
Father's description	N	%
Kind	338	83
Dominant	58	14.3
Harmful	6	1.5
Dictatorial	5	1.2
Mother's description	N	%
Kind	364	89.4
Dominant	34	8.4
Harmful	4	1
Dictatorial	51	1.2
Crowding index	N	%
One	54	13.3
Two	329	80.8
Three	24	5.9
Home atmosphere	N	%
Warm	202	49.6
Peaceful	51	12.5
Over-criticizing	37	9.1
Full of problems, annoying	117	28.7
Body weight	34–130	65.06 ± 14.84
Body mass index (BMI)	16–45	23.72 ± 4.72
Eating attitudes test scores	3–61	18.53 ± 9.25
Body shape preoccupation	No	%
High preoccupation (≥ 40 scores) (40–60)	83	20.4
Low preoccupation (< 40 scores) (10–39)	324	79.6
Body shape preoccupation	No	%
High preoccupation (≥ 40 scores) (40–60)	83	20.4
Low preoccupation (< 40 scores) (10–39)	324	79.6
Body shape preoccupation	No	%
High preoccupation (≥ 40 scores) (40–60)	83	20.4
Low preoccupation (< 40 scores) (10–39)	324	79.6

Table 1 Sociodemographic and clinical characteristics of the study sample (Continued)

Variables	Secondary school students (n = 407)	
	Range	Mean ± SD
Body Shape Questionnaire-Revised-10 (BSQ-R-10) total scores	10–60	28.6 ± 13.07
Self-esteem levels	No	%
Low level (< 40%) (0–23)	14	3.4
Moderate and high levels (40–100%) (24–60)	393	96.6
Self-esteem scale scores	Range	Mean ± SD
	11–58	39.65 ± 8.99

Comparison between students with and without eating disorders (n = 407)

Results showed that eating disorders are highly prevalent among female students (*P* value = 0.0001), as eating disorders were prevalent in only 7 male students in comparison to 31 female students, while other sociodemographic factors were not found to be significantly different among students with and without eating disorders (as shown in Table 3).

Results revealed that there was a significant statistical difference between students with and without eating disorders with regards to their body mass index, body shape preoccupation, low self-esteem (*P* value ≤ 0.008, 0.000, 0.000, respectively) (detailed data are illustrated in Table 4). The mean body weight among students with bulimia nervosa (75.12 kg ± 18.52) was significantly higher than that students with anorexia nervosa (55.46 kg ± 8.92). Similarly, students with bulimia nervosa were having a significantly higher body mass index (27.99 kg/m² ± 6.14) than students with anorexia nervosa (21.13 kg/m² ± 2.48).

Predictive factors of eating disorders among the study sample.

Logistic regression analysis was used to detect the predictive factors of eating disorders. We found that female gender, overweight (BMI = 25–29.9 kg/m²), low self-esteem, and high body shape preoccupation are predictive factors for eating disorders among adolescent students (as shown in Table 5).

Discussion

Adolescence period is frequently accompanied with special types of problems including body dissatisfaction and disturbed eating behaviors. Adolescent eating disorders are usually having a chronic course and associated with serious psychiatric and medical co-morbidities and complications [23].

Table 2 Prevalence and types of eating disorders among the study sample

Variables	Secondary school students in Eastern Tanta (n = 407)	
	N	%
Students with eating disorders	38	9.3
Students without eating disorders	369	90.7
Types of eating disorders:		
Anorexia nervosa	13	3.2
Bulimia nervosa	25	6.1

In the current study, the prevalence of eating disorders (EDs) in a representative scholastic sample was evaluated, and demographic and clinical factors associated with ED were assessed.

The results showed that male participants were significantly ($P \leq 0.0001$) heavier and taller than their female counterparts. These data are concordant with the general view that males were significantly heavier than females from various studies all over the world [24, 25].

The difference between males and females with regards to body weight could be explained with many biological factors like lower total muscle mass in females than males [26]; males convert more of their caloric intake into muscle, while females tend to convert more into fat deposits [27]. In addition, the greater muscular mass in males is described to be due to muscular hypertrophy as a result of higher levels of circulating testosterone in their blood [28].

Unsurprisingly, the current study showed that female students are significantly more preoccupied with their body shape (BSQ-R-10 = 31.68 ± 13.81) than their male counterparts (BSQ-R-10 = 25.63 ± 11.60). These data are in agreement with the results of previous studies which indicated that adolescent females significantly put greater importance of both body weight and shape on self-evaluation than males [29–32].

On the Eating Attitude Test (EAT), we found that 9.3 % of Egyptian adolescents had a tendency for disturbed eating behavior. Mintz and O'Halloran (2000) [33] reported a high specificity rate for the EAT-40 with an accuracy rate of at least 90% when used to differentially diagnose those with and without eating disorders. It also has an accepted discriminant capacity between clinical and non-clinical samples. This was replicated in the current study, which revealed that all (EAT-40) positive scorers were proved to have a full threshold eating disorder by SCID-1 interview.

These results are consistent with those of other Egyptian studies [17, 34, 35]. Moreover, our results also agreed with the results of many other studies in Arab and Western countries [36–38].

However, the results of a study investigating the eating disturbances among adolescent school girls in Jordan reported that eating disorder occurrence in a population sample using DSM-IV-TR diagnostic criteria is 33.4% which is higher than that observed in both Western and non-Western world [39]. Other studies reported much lower prevalence rates of eating disorders in adolescence. For example, Swanson and his colleagues found that eating disorders are prevalent in 3% of their adolescent samples [40]. These differences between various studies may be due to the variabilities in sample size, study setting and design, and the studies' targeted age and gender groups.

Moreover, the current study showed that bulimia nervosa is the commonest type of eating disorder encountered in the study sample (6.1% (25) students), while 3.2% (13 students) were having anorexia nervosa.

Although, the most common diagnosis of eating disorders among adolescents is Eating Disorder Not Otherwise Specified (EDNOS), the current study did not find any students with that diagnosis. The reason behind that may be due to the specific psychometric properties of EAT-40 with its ability to differentiate between threshold, subthreshold, and undifferentiated forms of eating disorders, with an accuracy rate of at least 90%. These results were found during the EAT-40 validation with DSM-IV eating disorder criteria [33]. It is consistent with the findings of this current study that all students with abnormal eating attitudes and behaviors (with EAT-40 score ≥ 30) have an eating disorder which was further confirmed by SCID-I.

Contrary to our study, other previous studies revealed lower prevalence rates for anorexia nervosa among adolescents. Prevalence of anorexia nervosa varied from 0 to 1.7% in previous American and European studies [41–45].

For a long time, anorexia and bulimia have been classified as a Western disorder or the disorder of the developed world, but the current study results clearly demonstrated that this assumption might not be true and confirmed the results of some other studies, which reported that the level of eating disorders is rising in the developing countries [46].

The higher estimate of AN in our study may reflect the highest level of underestimation of such disorders among this age group. This could reveal the huge magnitude of such mental health problems with decreased awareness of these disorders and limited access to health care specialists and appropriate interdisciplinary teams.

On the other hand, the prevalence of bulimia nervosa differs widely across different studies, with estimates ranging from 0.9 to 4.6% [44, 47, 48]. In a previous Egyptian study, bulimia nervosa was prevalent among 14 adolescent secondary school students (6.8%) from a total

Table 3 Comparison between students with and without eating disorders as regards sociodemographic data

Variables	Secondary school students in Eastern Tanta				X ² or t test and P value
	With eating disorders (n = 38)		Without eating disorders (n = 369)		
Age (years)	Range	Mean ± SD	Range	Mean ± SD	t = 0.04 P = 0.968
	16-17	16.05 ± 0.23	16-17.5	16.05 ± 0.23	
Gender	N	%	N	%	X ² = 17.647 P = 0.0001**
Males	7	18	200	54	
Females	31	82	169	46	
Father's income	N	%	N	%	X ² = 3.854 P = 0.278
No income	0	0	1	0.3	
Not enough	4	10.5	19	5.1	
Enough	24	63.2	203	55	
Enough and spare	10	26.3	146	39.6	
Father's description	N	%	N	%	X ² = 3.979 P = 0.264
Kind	29	76.3	309	83.7	
Dominant	9	23.7	49	13.3	
Harmful	0	0	6	1.6	
Dictatorial	0	0	5	1.4	
Mother's description	N	%	N	%	X ² = 2.31 P = 0.511
Kind	34	89.5	330	89.4	
Dominant	2	5.3	32	8.6	
Harmful	1	2.6	3	1	
Dictatorial	1	2.6	4	1	
Crowding index	N	%	N	%	X ² = 0.032 P = 0.984
One	5	13.2	49	13.3	
Two	31	81.5	298	80.7	
Three	2	5.3	22	6	
Home atmosphere	N	%	N	%	X ² = 5.434 P = 0.143
Warm	8	21.1	109	30	
Peaceful	17	44.7	185	50	
Over-criticizing	6	15.8	45	12	
Full of problems, annoying	7	18.4	30	8	

X² = chi-square test, P value: (*) significant if P < 0.05 and (**) highly significant if P < 0.001
t = Student's t test

of 205 students [35] which is consistent with the finding of the current study (6.1%).

Assessment of sociodemographic factors associated with eating disorders among Egyptian adolescents revealed that they are notably prevalent in females than males (82% of them were females and 18% were males), which is consistent with other various studies [49, 50]. Girls are more likely than boys to have weight and body dissatisfaction, body image concern, and dieting for weight control [30, 32].

Adolescence obesity/overweight and weight fluctuations may be considered as a risk factor for eating disorders later on in adulthood. Overweight girls showed some of the psychological features associated with the

development of EDs, including a link between concerns and self-esteem based on physical appearance [51]. Our study showed a higher mean body weight and body mass index among students with eating disorders than those without eating disorders. Further longitudinal follow-up studies are needed to demonstrate the relation between childhood body weight, BMI, and later development of eating disorders in adolescence.

Body shape and self-esteem play an important role in the development of eating disorders in adolescence [52]. Our data are highly concordant with this finding, as 68.4% of Egyptian students with eating disorders are highly preoccupied with their body shape in comparison to those without eating disorders (15.4%) with a highly

Table 4 Comparison between students with and without eating disorders as regards clinical characteristics

Variables	Secondary school students in Eastern Tanta				t test P
	With eating disorders (n = 38)		Without eating disorders (n = 369)		
	Range	Mean ± SD	Range	Mean ± SD	
Body weight (kg)	40–130	68.39 ± 18.38	34–120	64.72 ± 14.42	1.455 0.147
Body mass index (BMI)	17–45	25.65 ± 6.11	16–39.6	23.52 ± 4.52	2.663 0.008*
EAT-40 score	30–61	38.08 ± 8.4	3–29	16.51 ± 6.62	18.61 0.0001**
Body shape preoccupation	N	%	N	%	
High (40–60 scores)	26	68.4	57	15.4	χ ² = 59.553 P = 0.0001**
Low (10–39 scores)	12	31.6	312	84.6	
	Range (10–60)	Mean ± SD	Range	Mean ± SD	
BSQ-R-10 total score	32–60	47.31 ± 9.66	10–60	26.68 ± 11.80	t = 10.423 P = 0.0001**
Self-esteem	N	%	N	%	
Low (0–23 score)	9	23.7	5	1.4	χ ² = 51.717 P = 0.0001**
Moderate & High (24–60 score)	29	76.3	364	98.6	
	Range (0–60)	Mean ± SD	Range	Mean ± SD	
Self-esteem score	11–42	25.92 ± 5.97	16–58	41.06 ± 8	t = 11.333 P = 0.0001**

significant statistical difference between them. In addition, students with eating disorders have highly significant lower self-esteem (mean self-esteem score = 25.92 ± 5.97) than students without eating disorders (mean self-esteem score = 41.06 ± 8.00).

In agreement with other studies [38, 53, 54], our study showed that female gender, overweight (BMI = 25–29.9 kg/m²), low self-esteem, and high body shape preoccupation are significant predictive factors for the occurrence of eating disorders among adolescents.

One significant strength of our study was derived from using a representative sample, having high initial participation rates and low attrition rates, which closely represented the broader adolescent population.

Various limitations should also be considered in interpreting our results. First, being a cross-sectional design did not allow us to get causal inferences. Further

longitudinal studies are required to confirm the cause-effect relationships. Second, the use of (EAT) may limit the detection of students with subthreshold symptoms of eating disorders.

Conclusions

The finding of this study revealed that adolescent eating disorders are a highly prevalent but underestimated mental health problem in Egypt. Nonetheless, our findings might shed light on multiple sociodemographic and clinical correlates for adolescent eating disorders. This involves a complex interplay of biological, social, cultural, and psychological factors. More research is needed to explore the mechanisms behind it. Provision of a simple screening tool for eating disorders at schools and educational institutions is highly recommended.

Table 5 Predictive factors of eating disorders among the study sample

Independent variables	B	SE	EX (B)	Confidence interval (CI)		Sig. (P value)
				Lower limit	Upper limit	
Predictive factors						
Female gender	1.957	0.492	7.077	2.698	18.559	0.0001**
Overweight (BMI = 25–29.9)	1.482	0.718	4.401	1.078	17.976	0.039*
Low self-esteem level (0–23 score)	1.430	1.562	0.239	0.011	5.113	0.0001**
High body shape preoccupation (40–60 score)	2.079	0.445	0.125	0.052	0.299	0.0001**

P value: (*) significant if P < 0.05 and (**) highly significant if P < 0.001

B logistic regression coefficient, SE standard error of B, Exp (B) estimated odds ratio

Abbreviations

AN: Anorexia nervosa; B: Logistic regression coefficient; BMI: Body mass index; BSQ-R-10: Body Shape Questionnaire-Revised-10; CI: Confidence interval; EAT: Eating Attitude Test; ED: Eating disorders; EDNOS: Eating Disorder Not Otherwise Specified; Exp (B): Estimated odds ratio; SCID-I: Structured Clinical Interview for DSM-IV axis I Disorders; SE: Standard error of B

Acknowledgements

We would like to thank all participants who dedicated their time and attention to participate in this work.

Authors' contributions

WS designed the methodology. GS analyzed and interpreted the patient data. NM was the founder of the research idea. HE reviewed the methodology and results. MS collected the patient data. MM and WS were major contributors in writing the manuscript. All authors read and approved the final manuscript

Funding

The authors of this manuscript declare that no funding bodies were involved in sponsoring or funding this research.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate

The authors received the acceptance of the Ministry of Education before starting the study procedures. In addition, a written informed consent was obtained from the school manager for all included subjects who agreed to participate in the study. All subjects were informed about the questionnaires being used in the study and students who only accepted to share in the study were included. Interviews with the students were done at each school in private places that were determined by the school manager. The study was conducted in accordance with the guidelines of the Research and Ethics Committee of Okasha Institute of Psychiatry, Ain Shams University. The reference number is not available as at the time of conducting this study, the ethical approval was only a necessity at the departmental level without any other prerequisites from the university.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Received: 6 October 2020 Accepted: 9 November 2020

Published online: 25 November 2020

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