

Obesity and Self-Esteem among School Adolescent Students, Alexandria City, Egypt

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Abstract

Background: Obesity and low self-esteem are prevalent disorders among adolescents. Tackling this relationship may introduce effective intervention that promotes healthy adolescence. **Objectives:** to measure the prevalence of overweight and obesity and identify its relation with self-esteem among school adolescents. **Method:** A cross sectional study was carried out on 533 adolescents selected by multistage cluster sample. The students completed a structured questionnaire on dietary habits, physical activity and self-esteem. Self-esteem was assessed using Rosenberg Scale. Their anthropometric measurements (weight and height) were recorded. **Results:** 26.5% of adolescents are overweight and 13.3% are obese. Lack of physical activity is the only significant life style factor associated with overweight and obesity. There is a negative statistically significant correlation between self-esteem score and BMI among the adolescent students ($r = -0.33$ $P = 0.04$) and significant association between overweight and obesity and low self-esteem ($p = 0.047$). **Conclusion:** More than one fourth of adolescents are suffering from overweight and obesity. Obese adolescents tend to have lower self-esteem. **Recommendations:** Incorporating healthy behaviors and healthy life style in the curricula of adolescents to promote their mental health is mandatory. Further studies to investigate other risk factors of low self-esteem are needed.

Key words: *Obesity, Self-esteem, Adolescents, Physical activity, Lifestyle*

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Introduction

Adolescence is a very important stage of human development and is characterized by vital physical growth and maturation of secondary sexual characteristics.^{1,2}

Self-esteem is a great motivational force for adolescents. Self-esteem is an overall reflection of an individual's self-worth, incorporates beliefs about oneself in addition to an emotional response to those beliefs.³

Juveniles' and adolescents' increased weight state has been consistently associated with body dissatisfaction.^{4,5}

Obesity at certain stages of life especially adolescence may harm self esteem^[6], and negative body image is additionally common among people with childhood or adolescent onset of increasing weight^[7]. Although overweight adolescents experience fewer medical complications as compared to adults, they exhibit some signs of psychological and social distress, like depression and low levels of self-esteem.^{8,9} Several evidence-based studies have shown that obese teens have an increase incidence of poor self-esteem than their

non-obese peers.¹⁰ Obese teenage are more likely to be obese adults. A relationship between weight status and low self-esteem has also been established.¹¹ Adolescents suffer many cognitive and psychological changes in this critical transition to their adulthood. Low self-esteem can lead to serious problems as substance abuse, depression and suicidal ideations. Obesity in this age group, leads to high morbidity and mortality in adulthood.¹² Prevalence of obesity and overweight has rising trends especially in developed countries. Prevalence of overweight and obesity in Egypt are 20% and 10.7% respectively.¹³ Obesity presents a public health challenge with future implications that exceed the national health system capability.¹⁴ Identification of changeable risk factors for low self-esteem in adolescents is vital in developing interventions to stop the state of low self-esteem¹⁵. It is a priority to prevent obesity and improve self-esteem in this phase of life. The study aims to estimate the prevalence of obesity in school adolescents (10–19 years old) in Alexandria city and to determine its relation with self-esteem.

Method

A cross sectional study was carried out for adolescent preparatory and secondary school students at El Mountaza district in Alexandria governorate, Egypt during the academic year 2015-2016., The study was carried out in Abed El Menem Weasel preparatory School for girls and boys and two secondary schools (Abed El Menem Weasel secondary school for girls and EL Shaheed Mohamed Ramadan for boys).

Inclusion criteria: Apparently healthy adolescent's students aged 10-19 years, attending preparatory and secondary schools in Alexandria.

Exclusion criteria: Adolescent suffering from chronic systemic illness (cardiac,

renal, hepatic diseases), and those receiving drugs known to influence the body weight as corticosteroids, antidepressants and those on diet regimen.

Sampling Technique: Multistage cluster sample was used to obtain the representative sample of the participants of this study. *First stage:* Mountaza district was chosen randomly from seven districts in Alexandria. *Second stage:* One preparatory school was chosen randomly from 143 preparatory schools in Mountaza and two secondary schools were chosen randomly from 64 secondary schools in Mountaza district. *Third stage:* Each chosen school, one class was selected randomly from the first grade and one class from the second and third grade. According to numbers of adolescent in Mountazah districts 117503, 46% of them are females (54051), 54% of them are males (63451). The power 80%, confidence level 95%, prevalence of overweight in adolescent in Egypt 2011 was (15.0%) according to Egyptian National Nutrition Institute.¹⁶ Sample size was (533) 257 females and 276 males.

The students completed a structured questionnaire which was validated by a panel of experts and tested for reliability (0.8). The Arabic translation is valid and reliable. It is composed of the following sections: Section 1: *Personal history* which include age, sex, education, occupation, family members; economic status, home sanitation, health care to calculate socioeconomic status of the target group.¹⁷ This scale includes 7 domains with score of 84. Socioeconomic level was classified into: (1) Low socioeconomic class: less than 42 score. (2) Middle socioeconomic class: equal 43-63 score. (3) High socioeconomic class: more than or equal 64 score. Section 2: *Healthy and unhealthy diet*. Healthy diet: Healthy diet food intake classified into adequate and

inadequate intake according to Healthy Plate. Healthy Plate components are: Half of plate with fruit and vegetables, A quarter with whole-grains, A quarter with meat and fish, Focus on calcium-rich food.¹⁸ Selecting healthier unsaturated fats and oils (such as canola oil, soybean oil or olive oil), while limiting saturated and trans fat intake.

Unhealthy food include: fried food, soda drinks, French fries and potato chips, chocolate, fast foods, pizza.¹⁹

Section 3: *Physical activity*. Physical activity such as walking, swimming, playing football -----etc.²⁰ Classified the physical activity of them to mild, moderate and active. Mild: Adolescents should do physical activity 60 or more minutes daily less than 3 days of the week. Moderate: Adolescents should do physical activity 60 or more minutes daily on at least 3 days of the week. Active: Adolescents should do physical activity 60 or more minutes daily every days of the week

Adolescent who watching television (TV) and internet more than 2 hours per day.²¹

Anthropometric measurements: Anthropometric measurements (weight, height, BMI). Anthropometric measurements were taken for all participants. Body weight was measured for the students in light clothing and bare feet or with stockings using a digital scale to the nearest 0.1 kg. The digital scale was calibrated and checked daily for quality control. Also, height without shoes was measured and recorded to the nearest 0.5 cm.

The outcome variable definitions: BMI was calculated from the weight (kg)/height (m²). $BMI = [Weight (kg) / Height (m)^2]$.

In this study growth charts for adolescents were used. By plotting BMI against percentile curves of the standard Egyptian growth charts instructed by the faculty of

medicine Cairo University and National Re-search Center²², underweight: <5th percentile of BMI; normal weight: 5th to <85th percentile of BMI; overweight: 85th to <95th percentile of BMI and obese: ≥95th percentile for age and sex compared to corresponding percentile.

Self- esteem was measured by Rosenberg self-esteem scale²³: which includes the following items: (1) On the whole, I am satisfied with myself. (2) At times I think I am no good at all. (3) I feel that I have a number of good qualities. (4) I am able to do things as well as most other people. (5) I feel I do not have much to be proud of. (6) I feel that I'm a person of worth, at least on an equal plane with others. (7) I wish I could have more respect for myself. (8) All in all, I am inclined to feel that I am a failure. (9) I certainly feel useless at times. With likert scale: Strongly agree (SA) =3, Agree (A) =2, Disagree (D) =1, Strongly disagree SD=0

Scoring items 2, 5, 8, 9 are reversed score. Sum the scores for the 9 items. The higher the score, the higher the self-esteem. The scale ranges from 0-27. Scores between 12 and 25 are within normal range; scores below 12 suggest low self-esteem.²³

A pilot study was done to test the questionnaire and the need for modification and time needed to answer the questions. It was done on of sample size (107 students). No changes were done in the questionnaire so the data of pilot study were included in the study. The data were collected through interviewing all participants included in the study. The interview was 3 days per week for 2 months.

Statistical Analysis:

Continuous variables were reported as means with standard deviation (SD). Qualitative data were represented as frequencies and percentages; Chi-square test (χ^2) and Fisher exact test were used for

comparing groups. The Pearson correlation coefficients (r) were used to estimate association between obesity and self-esteem. The test results were considered significant when p -value <0.05 and all p values were two-tailed. Data were analyzed using Statistical Package of Social Science (SPSS), software version 16.0.²⁴

Ethical Considerations

This study was carried out within the ethics of scientific research and an ethical approval for this study was obtained from the Institutional Review Board of Zagazig University, Faculty of Medicine. All subjects were fully informed about the nature and objectives of this study and an oral informed consent was taken from them. All data were confidential and used only for the research purpose and they were not exposed to any harm or risk and the possibility of withdrawal at any time.

Official permission from head directorate of education and directors of the studied schools was obtained. Verbal informed consent from both adolescents and their parents were ensured.

Results

Table (1) shows socio-demographic data as the students aged (15-19) years are 400 (75%) with the mean age of the studied sample was 14.5 years and the standard deviation was 3.03 years. Males students are 276 (51.8%) of studied group while females students are 257 (48.2%), and 303 (56.8%) of students are in middle social class.

Figure (1) shows that 311 of the adolescents are normal BMI (58.3%) while 141 of them (26.5%) are overweight and 71 (13.3%) are obese. Only 10 students (1.9%) are under weight.

Table (2) shows that there are statistical significant relationship between gender and positive family history of obesity with

Table (1): Socio-demographic data of the studied adolescent students:

Variable	(n=533)	
	N.	%
Age (years):		
10 –	133	25
15 – 19	400	75
Mean age (years)	14.5±3.03	
Range	10 –19	
Sex:		
Male	276	51.8
Female	257	48.2
Residence:		
Rural	18	3.4
Urban	515	96.6
Socio-economic level:		
Low	123	23.1
Middle	303	56.8
High	107	20.1

overweight and obesity in this study, in which overweight is significantly higher among females ($p=0.03$) and positive family history of obesity is significantly higher among obese students ($p=0.006$), however no statistical significant association with age, residence or social class.

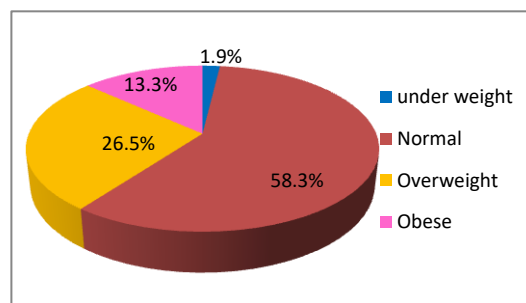


Figure (1): Pie chart showing distribution of adolescent students according to body mass index (BMI).

Table (3) shows that lack of physical activity is the only significant life style factor associated with overweight ($p=0.006$).

Figure (2) shows that there is negative statistical significant correlation between self-esteem score and BMI among the adolescent students ($r= -0.33$ $p=0.04$).

Table (2): Relation between demographic data of the adolescent students and BMI:

Variable	Total	Normal (n=311)		Over weight (n=141)		χ^2	P	Obese (n=71)		χ^2	P
		N.	%	N.	%			N.	%		
Age (years):											
10 –	131	74	56.5	34	26.0	0.005	0.94	23	17.5	2.26	0.13
15 – 19	392	237	60.5	107	27.3			48	12.2		
Sex:											
Male	272	168	61.8	61	22.4	4.49	0.03*	43	15.8	1.001	0.32
Female	251	143	57	80	31.9			28	11.1		
Residence:											
Rural	17	9	52.9	6	35.3	---	0.62	2	11.8	---	0.99
Urban	506	302	59.7	135	26.7			69	13.6		
Social class:											
Low	118	66	55.9	32	27.2	0.14	0.93	20	16.9		
Middle	300	185	61.6	83	27.7			32	10.7	4.91	0.086
High	105	60	57.1	26	24.8			19	18.1		
Obesity in family:											
No	344	219	63.7	87	25.3	3.37	0.066	38	11.0	7.49	0.006**
Yes	179	92	51.4	54	30.2			33	18.4		

Fisher exact test *: Significant ($p \leq 0.05$) **: Highly significant ($p \leq 0.01$)

Table (3) Relationship between life style and BMI of the adolescent students:

Variable	Total	Normal (n=311)		Over weight (n=141)		χ^2	P	Obese (n=71)		χ^2	P
		N.	%	N.	%			N.	%		
Healthy food intake:											
Adequate	278	173	62.2	73	26.3	0.58	0.44	32	11.5	2.59	0.107
inadequate	245	138	56.3	68	27.8			39	15.9		
Unhealthy food intake:											
Yes	342	211	61.7	90	26.3	0.7	0.4	41	12.0		
No	181	100	55.2	51	28.2			30	16.6	2.63	0.105
Physical activity:											
No	195	98	50.2	68	34.9			29	14.9		
Mild	160	105	65.6	33	20.6	12.45	0.006**	22	13.8		
Moderate	64	39	60.9	17	26.6			8	12.5	2.49	0.48
Active	104	69	66.4	23	22.1			12	11.5		
Sedentary life:											
No	143	84	58.7	37	25.9	0.029	0.86	22	15.4	0.46	0.49
Yes	380	227	59.7	104	27.4			49	12.9		

Table (4): shows statistical significant association between overweight and obesity with low self-esteem ($p=0.047$).

Discussion

Prevalence of obesity and overweight among adolescents has reached alarming levels. This study found that 26.5% of

adolescents were overweight and 13.3% were obese (figure 1). This is similar to rates reported by Talat and Shahat (2016) in Sharkia Governorate, Egypt who found that the prevalence of overweight and obesity was 20% and 10.7% respectively²⁵ and also developed countries as USA which reported

prevalence of obesity among adolescents aged 12 to 19 years was 20.5% in 2011-2014.²⁶

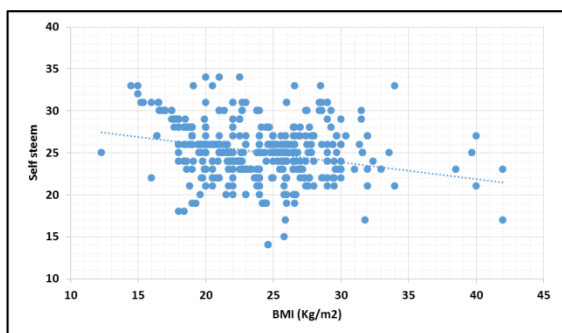


Figure (2): Significant inverse correlation between self-esteem and BMI of the studied adolescent students ($r = -0.33$ $p = 0.04$).

Arabian countries like Saudi Arabia²⁷, Palestine²⁸ and Tunis²⁹ reported that obesity among adolescents is the coming epidemic. This may be explained by overweight and obesity is multi-factorial health problems. Faulty eating habits (snacks and fast food), lack of physical activity and spending more times on TV and internet are the main known risk factors. The prevalence of overweight is more among females (31.9%) than males (22.4%) as shown in (table 2). This was in agreement with other studied in Egypt as El-Sabagh et al., (2014) and El – Mogy (2016) who stated that overweight were more prevalent among females than males (66.15%

and 71.2%) respectively [30, 31]. This may be explained by that males have more bones and muscles than females. Muscle burns more calories than other tissues (which includes fat). As a result, females have a slower metabolism than males and hence, have a tendency to gain more weight than men and weight loss is more difficult for females. Thus, females are more likely than males to gain weight with the same caloric intake. In addition, during puberty, changes in body composition occur; when girls tend to increase fat mass as a result of maturation while boys tend to increase muscle and other nonfat body mass. The low percentage of obesity among female students in this study (11.1%) may be explained by females care of her outside appearance.

Also association between BMI and positive family history of obesity is found to be statistically significant among studied adolescents in which about one third of students who have positive history of obesity in the family were overweight (30.2%) and about (18.4%) of them were obese (table 2). This was agreed with El-Sabagh et al., (2014) who stated that significant positive family history was present in 33.85% of overweight adolescents and in 73.7% of obese ones.³⁰

Table (4): Relationship between self-esteem and BMI of the studied adolescent students.

BMI	Low Self esteem n=370		High Self-esteem n=163		χ^2	P
	No	%	No	%		
• Under and Normal weight (n=321)	210	65.4	111	34.6	6.21	0.047*
• Overweight (n=141)	107	75.9	34	24.1		
• Obese (n=71)	53	74.6	18	25.5		

This may be explained by genetic factors that have a great effect in the development of obesity. Also the family environment plays a major role as a risk for adolescents

to be obese. For adolescents with sedentary life 34.9% were overweight and 14.9% obese. Our study revealed that there is statistical significant association between

obesity and physical inactivity (table 3); this was in agreement with other studies as Mosleh et al., (2011) in Egypt and Souza et al. (2010) in Brazil who found that physical inactivity higher among overweight and obese individuals.^{32,33} On the contrary El-Azaab in Egypt and Abd El-Lateef et al. in Palestine who found that no significant association was found between physical activities and BMI.^{34,35} Regarding associated risk factors of obesity in our study; gender, positive family history of obesity and lack of physical activity were the statistically significant factors.

Literature recognized the relationship between obesity and self-esteem but there was controversy; whether low self-esteem leads to overweight and obesity or the reverse. As self-esteem is the motivational drive for adolescents to realize their capabilities, obese ones tend to have low self-esteem and more liable to serious outcomes such as depression, suicide, eating disorders and substance abuse.¹¹ This study found that there was statistically significant negative correlation between BMI and self-esteem ($r = -0.33$ $p = 0.04$) (figure 2) and statistical significant association between self-esteem and BMI in which low self-esteem was present in about three quarters of overweight and obese adolescents (75.9%, 74.6%) respectively compared with 65.4% of normal and underweight students ($p = 0.047$) table (4). This is in agreement with Mendiratta who stated that obesity is inversely related to self-esteem consequently, obesity jeopardize mental health of adolescents^[36]. Nemiary et al, and Radziwillxowiz also reported that overweight and obese adolescents are characterized by low-self esteem.^{15,37} Also in a study done by Griffiths et al. (2010) showed that there was significant reductions in global self-esteem and quality of life in obese youth.³⁸

Conclusion

Overweight and obesity are serious problems among adolescents with underlying interaction of many factors related to life style. These obese adolescents suffer from low self-esteem, so the study recommends raising awareness of adolescents regarding healthy life style by incorporating this in their curricula. Further studies needed to explore other risk factors of low self-esteem. Interventions as weight reduction can be helpful to attain high self-esteem.

Limitations of the study: This study could not assess other factors related to low self-esteem. Low self-esteem and its consequences as anxiety and depression are difficult issues to be judged in that age group. Temporal sequence and reciprocal relation between obesity and low self-esteem could not be assessed.

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