



Original Article

Anxiety and depression in adolescents with abnormal body mass index with normal population

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Abstract

Introduction: In recent years, non-communicable diseases such as obesity had a major contributor to morbidity and mortality in human societies. These diseases are associated with dysfunction of various organs of the body. This study aimed to evaluate anxiety and depression in adolescents with abnormal body mass index with normal population.

Materials and Methods: This is the case-control study conducted on adolescents in Birjand. To determine the level of anxiety, Tzanck self-evaluation scale anxiety and to evaluate depression, kids and adolescents depression inventory were used. Data analyzed through SPSS software version 15 and statistical tests, chi-square, Fisher's exact test and independent t-test.

Results: A total of 204 adolescents were enrolled. There is significant difference in mean score of anxiety was observed in obese children and overweight with normal mean of anxiety in adolescents overweight and obese was significantly higher than normal adolescents ($P < 0.001$). There is significant difference in mean depression score was observed in obese children and overweight with normal mean of anxiety in adolescents overweight and obese was significantly higher than normal teenagers ($P < 0.001$).

Conclusion: The results of this study have been shown that anxiety and depression have a significant relation with abnormality in body mass index and this abnormality can impact adolescents' depression and anxiety.

Keywords: Adolescents, Anxiety, Body mass index, Depression

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Introduction

Childhood and adolescence obesity is accompanied with various physical and psychological complications. Studies indicated the progressive prevalence of psychological disorders related to obesity such as anxiety among children and adolescents with disorder of body mass index (1,2). In addition to anxiety, overweight and obesity can be a risk factor for depression (3). Depression can decrease self-esteem (4), decreased academic achievement and overall it may lead to occupational, familial and social dysfunctions (5). Although cultural tensions related to appearance and body image disorder can lead to depression among adolescents especially girls who more sensitive about

their body image because obese individuals almost face to negative attitude. Lamertz believes that obesity can lead to negative attitude, psychological tension and increased risk of psychological disorders (6). Also, it is mentioned that obesity can not lead to depression in all cases but depression is a main factor of obesity (7). Although most of obsess individuals experience social isolation and depression because of discrimination, dissatisfaction about body image or reduced physical health (8,9). Richardson found that depression in adolescence can increase risk of obesity two times more than individuals without history of depression. This depression is not healed through weight reduction and it needs to pharmacological or non-pharmacological treatments under physicians supervision (10).

Unfortunately, epidemiologic studies were conducted in our country and the main outcomes of

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obesity such as anxiety and depression were assessed lesser than prevalence studies. In the other hand, there are very few studies among students and the type of limited studies are usually descriptive-analytic (8) and there are very limited causal-comparative studies with controversial results although there are evidences about the relation between obesity and depression. So regarding to Iranian epidemiologic studies which almost ignored the internalized behavioral problems of obese or over-weighted adolescents, the present study aimed to assess the psychological problems such as depression and anxiety among obese or over-weighted adolescents compared to normal adolescents.

Materials and Methods

This is an analytical case-control study with sample size of 102 cases in each group of adolescents. The statistical community included students in a first or second grade of high school in Birjand city. Sampling conducted via multi-phase randomized method. At first, Birjand city divided into four zone then the lists of high schools of each zone concerned as cluster. Then one girl high school and one boy high school selected from each zone via sample randomized method. In each grade, the body mass index of students was calculated then one student with normal weight was selected as control versus each case with overweight or obesity.

The anxiety scores were selected through Sank self-rating scale. The rate of anxiety calculated through pure score which grading based on the cutoff points in normal (25-45), mild (45-50) and medium (51-59). The rate of depression evaluated through child and adolescent depression questionnaire. This questionnaire has 42 symptoms of disorder which almost of them are overlapped and decreased. The criteria which have most overlaps in different theories were derived and compared to DSM criteria for depression in children. Then list of 12 different items was provided. The total score with scale of the community of questionnaire (children and adolescents aged 7-18 years who educated in Tehran) was compared and the level of each person indicated.

In this research, collected data entered to SPSS software version 15 and analyzed through chi square, exact fisher test and independent t in level of 0.05.

Results

This study conducted in 102 obese adolescents

with mean BMI (27.9 ± 4.1) and 102 normal adolescents with mean BMI (19.9 ± 2.3). There were not significant differences in mothers job, parents educational level, mean age, family dimension and birth rating, gender and educational grade among two groups ($P > 0.05$). The mean score of anxiety in obese and overweight adolescents was significantly more than normal cases (37.1 vs 31.1, $P < 0.001$) (Table 1). Also, the mean score of depression in obese and overweight adolescents was significantly more than normal cases (14.3 vs 5.49, $P < 0.001$) (Table 2).

Table 1. Comparison of mean score of anxiety among normal and obese adolescents

Variable	Prevalence	Mean	Standard deviation	Independent t-test
Normal	102	31.1	6.9	t=5.97
Overweight and obese	102	37.1	7.3	df=202 $P < 0.001$

Table 2. Comparison of mean score of depression among normal and obese adolescents

Variable	Prevalence	Mean	Standard deviation	Independent t-test
Normal	102	5.49	3.4	t=12.1
Overweight and obese	102	14.30	6.4	df=202 $P < 0.001$

Discussion

Obesity and overweight, is one of the risk factors of many diseases and its negative effects threat mental health in addition to physical health. This research conducted 204 obese, overweight and normal adolescents. The results indicated that the mean scores of anxiety and depression among adolescents with body mass index disorder are higher significantly than normal adolescents.

As mentioned, the mean score of anxiety among adolescents with body mass index disorder was higher than normal adolescents. This finding is concordant with the prior studies which assessed the relationship between anxiety and overweight. Aliakbari Dehkordi indicated that the mean score of anxiety among overweight girls was higher significantly than normal girls (11). Also, the results of the present study are concordant with the results of studies which conducted by Aparicio et al. (12), Fattahi et al. (13), Ghanbari et al. (14), Pais-Ribeiro et al. (15), Guedes et al. (16) and Seyyed Amini et al. (17). In all these studies, the mean score of anxiety among obese and overweight adolescents was higher significantly than normal group, although Vafaei et al. study did not indicate significant relationship between anxiety disorder and overweight (18). It seems that obese persons

have fewer friends and they ridiculed or they feel which lead to increasing anxiety. May be awareness about the adverse effects of obesity on physical health may lead to worry and anxiety.

On the other hand, the mean score of depression among adolescents with obesity and overweight was higher than normal adolescents. In some studies, there is relationship between obesity and depression (2,5,18). The various mechanisms such as the roles of physiological and behavioral and even genetic factors are suggested in obesity and depression. It seems that obesity decreases the self-esteem and aggravates the symptoms of depression. In addition to behavioral and psychological factors, nutritional factors and decreased physical activity can lead to obesity and depression. The relationship between decreased physical activity and depression is suggested in the recent years and needs to more study. In term of physiology, it seems that some mechanism related to tension can produce pre-

inflammatory cytokines which these mechanisms are seen in both obesity and depression. Brain endorphins play role in both obesity and depression. Depression can interrupt the axis of serotonin activity and activates the adrenal-hypothalamus-pituitary axis. This axis is active in obesity especially in abdominal obesity (16). In many studies such as Guedes et al. study (16), Safaralizadeh (19), Rahimi (20) and Seyyed Amini et al. (17) there was positive correlation between body mass index and depression.

Conclusion

Whether depression causes obesity or obesity leads to depression requires more studies but regarding to the present results it may be suggested that there is relationship between depression and overweight and obesity. It seems that interventions to control obesity for reducing anxiety can be effective in students' health development.

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