The investigation of Obesity, Impotence, Physical activity and Caloric Intake among Boys High Schools of Mako City

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ABSTRACT

Background: Obesity is a costly public health problem and its increasing prevalence in children is a global problem and dealing with them requires having information about their prevalence and risk factors. Objective: The aim of this study was to help complete knowledge about the prevalence and risk factors of obesity and lean. This descriptive - analytical study was based on a sample of male students from first to third grade (12-14 years), in the city of Maku. 650 students were selected by random sampling. Demographic data were collected using inventory, food intake was assessed by food frequency questionnaire and physical activity was evaluated through physical activity questionnaire (PAQ-C). Height and weight were measured using standard method and body mass index (BMI) was calculated. Data were descriptively and statistically analyzed using SPSS software. Results: The prevalence of underweight, overweight and obesity was 1.12%, 8.10% and 8%, respectively. There was a significant inverse relationship between physical activity levels and BMI and significant positive association between parental educational level and sedentary behaviors such as television viewing and working with a computer and BMI was observed. Despite the high level of caloric intake in obese people, no significant correlation was found between BMI and caloric intake and macronutrient. In this study, no significant correlation between the frequency of breakfast consumption and BMI was observed.

INTRODUCTION

In recent decades, due to the economic, social, health and community development, and also urbanization and industrialization, rapid changes have been raised in diet and lifestyle of societies. Consequently, the pattern of communicable diseases evolved to non-communicable and chronic diseases [1, 2]. Obesity is a chronic disease caused by unhealthy lifestyle that today, is considered as the challenges of the health care system and occurs in most of the adult and even adolescent populations. It seems that the root of obesity as a health threat should be sought in adolescence period since this stage of life is a critical period for the development of overweight and obesity that is associated with the incidence of obesity and non-communicable diseases in adulthood. Obesity is a multivariable phenomenon that rises from complex interaction of several factors, including genetics and human behavior (physical activity and dietary patterns) [3, 4]. In turn behaviors are also under the affects of the social, cultural and environmental conditions. Recent studies, in Iran, indicate an increased incidence of overweight and obesity in adolescents. The studies have shown that obese children and adolescents are exposed to many problems, including high blood sugar, blood pressure and cholesterol and also have glucose tolerance disorder. The epidemiology of overweight and obesity are the main concerns of developing countries in the last two decades and it is known as the epidemic of the 21st century [5, 6, 7]. Unfavorable lifestyle habits and especially physical inactivity in children and adolescents, In addition to being a threat to the health of this vulnerable group, can expose the population to epidemic of non-communicable diseases such as cardiovascular disease, diabetes, osteoporosis, heart attack, hypertension and even some cancers [8]. Along with obesity, underweight and thinness are also among the most common childhood disorders. So that thinness in adolescence is a risk factor for chronic diseases in adulthood and Increases
mortality health problems in adolescence and adulthood. Over the past two decades, the prevalence of thinness in Iranian children was also significantly high although this rate has decreased to some extent. But still it is one of the most common disorders of childhood. Studies have shown that obesity and thinness of adults are correlated with obesity and thinness of teens [9]. According to studies, 70% of 13-10 year obese children will be obese in adulthood. Thus, some guidelines for the prevention of this phenomenon, in adolescents, should be considered to reduce the negative consequences in adulthood. The results of a study on the relationship between physical activity and dietary behaviors of boys with their body mass index indicates that, Physical activity levels of children inversely correlated with BMI and. This means that children, who had regular physical activity, had proper and normal weight. So the above evidence leads the investigators to test a new study, which is called "predicting", to add new information on the previous findings and provide practical strategies to reduce the incidence of obesity and thinness in children [10, 11].

MATERIALS AND METHODS

This study is a descriptive – analytical research which is conducted to evaluate the state of thinness, obesity and their association with physical activity and feeding behavior of 12-14 year boys in Makou city. Statistical population in this study was all the 12-14 years students (first to third grade). Three research instruments were used to collect data, including demographic characteristics questionnaire, Food Frequency Questionnaire and Physical Activity Physical Activity Questionnaire. These Questionnaires were collected through interviews with students by trained and skilled researchers.

Students' height was measured using a strip meter in centimeters while they stood back to the wall without shoes. Students' weight was measured without shoes and with minimal clothing in kilograms using Medicine scales. Body mass index (BMI) of students was calculated using the formula weight (kg) divided by squared height (in meters). BMI Percentiles of the Center for Disease Control and prevention were used to determine the status of thinness, overweight and obesity. BMI below the 5th percentile as thinness, BMI above the 95th percentile as obesity and BMI from 85 to 95 was defined as overweight. List of students' demographic characteristics including occupation and education of parents, Number of breakfast meals, watching TV and the computer and the way they go to school, were completed by students. 9-item Physical activity questionnaire (PAQ-C) was used to measure students' physical activity. The questionnaire was graded from 1 to 5 to determine the student's level of physical activity. Increasing scores indicate high physical activity. Content validity index was used to assess the validity of the questionnaire, using a panel of experts. Receiving expert suggestions, necessary modifications were made and the validity of the questionnaire was confirmed. Cronbach's alpha scale was used to measure the reliability of questionnaire, and its amount was equal to 0.80 so the reliability was also confirmed. Food frequency questionnaire was used to measure nutritional intake. Validity and reliability of the questionnaire has been approved for Iranian society by the Endocrine Research Center, Shaheed Beheshti University of Medical Sciences. To analysis of the questionnaire and calorie intake Food Processor software was used.

Data were analyzed through descriptive statistics (measures of central tendency and dispersion) and inferential statistical methods (Pearson and Spearman correlation, Kruskal-Wallis test and ANOVA) in spss software.

Mean and standard deviation of students' total weight were 45±10.9.1kg. And the mean and standard deviation of their height were 154±8. After calculating BMI from weight and height, the mean and standard deviation of total BMI was 18.8±3.5. Approximately 90% of students parents had education level less and others higher than diploma. The results of this study showed that the prevalence of underweight, overweight and obesity in 12-14 years boys in Mako were respectively 12.1%, 10.8% and 8% and the mean level of physical activity in skinny, normal, overweight and obese adolescents were respectively, 2.99, 2.90, 2.23 and 2.30.

A significant inverse relationship was observed between physical activity and BMI (P<0.05). The level of physical activities was significantly different between overweighted and obese students and thinness and underweighted ones. No significant differences in levels of physical activity were observed between obese and normal weight subjects. (Figure1).

Increase in sedentary behaviors (watching television or working on computer) was also strongly associated with overweight and obesity (P<0.05). The mean of caloric intake in lean, normal, overweight and obese subjects were respectively 1976,1907,1968 and 2022 kcal per day (Figure 2).

No significant association between BMI and caloric and macronutrient intake were observed (Table 1). There were no relationship between the number of breakfast meal and BMI(table2).
Fig. 1: Mean scores on the physical activity levels of the subjects according to BMI.

![Physical activity levels](image)

Fig. 2: Mean daily caloric intake of the subjects in terms of BMI.

![Caloric intake](image)

### Table 1: Pearson correlation coefficients between BMI and dietary variables.

<table>
<thead>
<tr>
<th></th>
<th>Caloric intake</th>
<th>Protein intake</th>
<th>Carbohydrate intake</th>
<th>Fat intake</th>
<th>Percentage of energy from protein</th>
<th>Percentage of energy from carbohydrate</th>
<th>Percentage of energy from fat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r</strong> BMI</td>
<td>0.075</td>
<td>0.075</td>
<td>0.075</td>
<td>0.075</td>
<td>0.021</td>
<td>0.041</td>
<td>0.048</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td>0.063</td>
<td>0.061</td>
<td>0.061</td>
<td>0.065</td>
<td>0.6</td>
<td>0.2</td>
<td>0.2</td>
</tr>
</tbody>
</table>

### Table 2: Frequency of eating breakfast on a week by age and weight.

<table>
<thead>
<tr>
<th>Frequency of eating breakfast in different weight groups</th>
<th>thin</th>
<th>normal</th>
<th>overweight</th>
<th>obese</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 years</td>
<td>2.4±4.1</td>
<td>2.5±5.2</td>
<td>4.2±2.4</td>
<td>4.6±2.2</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>13 years</td>
<td>1.6±5.2</td>
<td>2.2±5.2</td>
<td>4.6±2/</td>
<td>5.2±2/4</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>14 years</td>
<td>1.7±5.2</td>
<td>2.1±5.2</td>
<td>4.4±2/4</td>
<td>4.3±2/4</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>All ages</td>
<td>1.9±4.9</td>
<td>2.1±5.2</td>
<td>4.4±2/4</td>
<td>4.8±2/4</td>
<td>P&gt;0.05</td>
</tr>
</tbody>
</table>

Conclusion: The results of the recent study have increased our knowledge about obesity and slimness as a potential factor, threatening the health of sample children, in one case at least, both in adolescence and in adulthood.

The results of this study showed that the prevalence of overweight and obesity in the male adolescents of Maku city, Iran, aged 12-14, were respectively 10.8% and 8%.

In 2008, Agarwal et al reported the study results of overweight and obesity's prevalence amount in Indian students, respectively as 15% and 34% [12]. Owner et al (2004), described prevalence of overweight and obesity in Turkish adolescents aged 12-17, as 11.9%, 2.6% [13].

In spite of the slight difference in the prevalence rate of obesity and overweight in the studies as to the region countries, more prevalence amount of overweight and obesity in children was reported by other studies, than the current studies [14, 15, and 16].

Researchers mentioned the rapid changes in dietary patterns, high food intake and lack of movement, as the main reasons of high prevalence rate of obesity in the areas of study [15, 17]. Of one of the other findings, it was a high prevalence of overweight (12.1%) reported, in male adolescents aged 12-14 years old, compared with the obesity rate of (8%).

Reddy et al (2008), reported prevalence rate of overweight in boys aged 13-19 years old in South Africa as 14.6%, and in the Lazry et al (2008) studies, the prevalence rates of overweight in Italian teens of 11, 13, and 15 years old, were reported respectively as 10.1%, 8%, and 8.7% [18, 19].

Correspondingly, the present study results in Iran are highly consistent with the current research findings [6, 7, and 20].

On the contrary, studies made in other countries have provided different results, indicating that the reported prevalence rate of underweight in children under studies was lower than the rate, obtained by the present study [21, 22].
Some of the other countries studies, similarly, received results with much higher prevalence rate of overweight in children, than the recent study findings [11, 15].

Apparently, racial differences, climate, socio-economic and nutritional factors are of the most oscillation causes of this phenomenon in these countries.

Allowing for Maku city’s prevalence rate of 12.1%, one can conclude that this rate seems to be distressing to some extent.

It is assumed that malnutrition is still one of the commonest problems in students of Makoo and it is a major cause of atrophy in this area. In other words, since Makoo city lies in an intermediate position in terms of socio-economic, nutritional and lifestyle, it seems logical that the prevalence of this phenomenon is more prevalent than Tehran and less prevalent than semi-deprived and deprived areas. The study results revealed that there was a significant inverse relationship between physical activity and Body Mass Index (BMI) in adolescents aged between 12-14 years old range. This means that children who had good physical activity, had a low BMI and a normal weight, compared with sedentary children. Also, an increase in sedentary behaviors (watching TV or working on the computer) was strongly associated with overweight and obesity. The results of some studies are consistent with our findings. For example, Rahmani, et al (2004) showed a significant and inverse relationship between physical activity and overweight and obesity in adolescents aged 12-17 years old in Rasht city [23]. Also, other studies supported our results in this area (5, 6). Although we didn’t find any significant relationship between BMI and breakfast consumption shifts in the present study, breakfast consumption shifts in overweight – fat group was significantly lower than the in normal-weight group. This conclusion was supported by other studies. For example, Vanley, et al [24] conducted a study in Italy and found that overweight and obese adolescents eat fewer breakfast shifts per week than normal-weight adolescents. Bork, et al (2003) found a significant and positive correlation between absence of breakfast consumption and overweight in American adolescents aged between 9-14 years old. Some studies have found no association between breakfast consumption and different weight conditions including a study conducted by Sadr zadeh, et al (2006). However, Anderson, et al (2005) found quite different results in the United States of America in comparison to other studies. They observed positive and significant relationship between BMI and breakfast consumption and overweight. However, most studies assert that obese people tend to eat less breakfast than their non-obese counterparts [24]. When children do not eat breakfast, they may have more desire to eat outside fast-foods that are rich in simple sugars and have high levels of fat. Thus, excessive consumption of these foods put the children in a position to gain overweight and will be prone to obesity in a very short time. In other words, removing breakfast from the schedule of fat persons may be a way to manage and reduce their weight (Bootel, 2002) but it will not be effective not only in reducing weight but also leads to more obese children. However, further studies are needed in this area to clarify this issue. The results of this study revealed a significant and positive correlation between BMI and education level of parents. Parental education levels in overweight - obese group was significantly higher than in the normal weight group. Allen, et al (2009) showed a significant and positive correlation between education level of parents and overweight in the U.S. adolescents aged between 12-19 years old. Shahgholian, et al (2003) conducted a study on the students aged between 7-12 years old in Char Mahal and Bakhtiari province and found that the higher the education level of parents, especially mothers, the more the level of obesity in male students. However, they did not prove the existence of this relationship in the case of female students. They stated that with increasing level of education, mothers attach more importance to feed their children got and imbalance and excessive use of carbohydrate and fat by these children can lead to their obesity. They also stated that this may be because of our culture norms, in which the male sex is the symbol of power and female sex is the symbol of elegance and thus, educated mothers pay more attention to their boys’ nutrition and their girls’ organ delicacy. High educational level of parents as one of the indicators of social-economic improvement status can be an important factor in improving the nutritional status and improvement of the economic welfare of the children. Thus, the high prevalence of obesity and overweight in adolescents with parents with higher education is not an unexpected issue in our study. However, Platt, et al (2003) found a significant and positive relationship between mothers’ low levels of education and overweight in adolescents aged between 10-14 years old in eastern part of France. This finding can be due to loss of monitoring and control of mothers with low levels of education on the eating behaviors and health care of their children. Overall, although the problem of atrophy of adolescents aged between 12-14 years old is still prevalent in Makoo city, the more important issue is the high prevalence of overweight and obesity and their growingly trend. These findings indicate that we are moving towards overweight and obesity in children. In addition, low levels of physical activity and increase in sedentary behaviors (watching television or working on computer) in male adolescents of Makoo is associated with their overweight and obesity. However, no association was found between dietary patterns and overweight and obesity. Thus, implementation of effective intervention programs centered on effective behaviors in preventing high-risk behaviors of overweight and obesity in children, seem a very necessary action.
REFERENCES


