

## Brief report

# Frequency of Obesity and Thinness among first grade Students of Imam Hossein Shahed Elementary School in Tehran, Iran

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## Abstract

**Background:** The obesity epidemic, at one time confined to adults, has now penetrated the pediatric age range and shows every sign of a rapid escalation. Obese children may be at increased risk of becoming obese adults. The aim of this study was to determine the height and weight and body mass index of first grade students at Imam Hossein Shahed elementary School in Tehran, Iran.

**Materials and Methods:** Body weight was measured by digital Microlife scale and height was measured to the nearest 0.1 cm with portable stadiometer in 51 first grade children aged 7-8 years.

**Results:** A total of 51 first grade students were evaluated, 33 (64.17%) had normal body mass index, 4 (7.84%) were underweight, 11 (21.57%) were overweight and 3 (5.88%) were thin.

**Conclusion:** Based on our findings, the prevalence of obesity was more pronounced than that of thinness in schoolchildren. Therefore, preventive measures for controlling obesity are necessary for public health promotion among schoolchildren.

**Keywords:** Obesity, Thinness, first grade Students

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## Introduction

Obesity has become a global epidemic problem<sup>1</sup>. Since obesity is one of the important risk factors for hypertension, diabetes, heart diseases and some forms of cancers, therefore prevention of obesity among young people is a priority. Identification of children at risk for adult obesity might cause to early prevention for adult obesity and its associated complications<sup>2</sup>. However, it is still a matter of debate as to how to define obesity in young people<sup>3-5</sup>.

It is important to evaluate the growth rate in children. One of the most important international indicators for evaluating physical and physical growth is height and weight measurement, body mass index<sup>4</sup> (BMI) and comparing it with global standard curves (including

WHO: World Health Organization). Body mass index (weight in kg/height<sup>2</sup> by meter) is widely used to assess overweight and obesity. In children, BMI changes considerably during growth and development. Although body mass index is simple to measure and has been a valuable tool in monitoring trends in obesity, it also has numerous disadvantages<sup>6</sup>.

Increase of height and weight in society is under the influence of different factors. There are many factors, which is specific to the community; these factors can be inheritance, race, mode, economic and cultural terms. Overweight and obesity are rising in many societies. Recent studies in Iran have shown a change in lifestyle and, in turn, a limitation of physical activity and the type of nutrition of the Iranian community associated with obesity.

Obesity, especially abdominal obesity in children, is responsible for many of the chronic diseases that cannot survive in the long term, including insulin resistance, high blood glucose, type 2 diabetes, high blood pressure, cardiovascular disease, various forms of malignancy and psychosocial problems. Therefore, lifestyle-related factors in childhood, can affect the physical and mental health of children and the impact of adolescents' chronic non-communicable diseases in adulthood.

Much has been written about the epidemic of child obesity<sup>7</sup> but malnutrition—meaning undernutrition—in infants, children, and adolescents poses a considerably larger public health problem internationally<sup>8, 9</sup> and in the developed world anorexia nervosa is the third most common chronic condition of adolescence<sup>10</sup>. Obesity and malnutrition represent opposite extremes on the spectrum of adiposity, and both are routinely quantified in terms of weight and height relative to the child's age<sup>11</sup>. In adults, underweight or thinness indicates low BMI, whereas in children underweight is low weight for age and wasting is low weight for height<sup>11</sup>.

## Methods

Our study was a cross-sectional study and the study population consists of 51 first grade students of Imam Hossein Shahed elementary school in Tehran, Iran, 2016. Two field workers conducted measurements on school premises. Height was measured to the nearest 0.1 cm with portable stadiometer with children standing in bare feet. Body weight was measured by digital Microlife scale. Body mass index was calculated as weight (kg)/height<sup>2</sup>(m<sup>2</sup>). For statistical analysis, we used SPSS 21 and descriptive statistical methods (mostly frequency) to analyze these results.

## Results

In this study, 51 first grade students in Imam Hossein Shahed elementary school, 33 (64.17%) had normal BMI, 4 (7.84%) were underweight, 11 (21.57%) were overweight and 3 (5.88%) were thin. The findings of the present study on the status of BMI as a measure of weight and height showed a significant percentage of students with weight loss, overweight,

obesity and thinness. Therefore, we should consider the presence of malnutrition in the first grade students of this school.

## Discussion

The obesity epidemic is a relatively new public health problem. Having height and weight standards is one of the important information that is used in relation to the development and nutrition status of children and adolescents. It should be mentioned that the findings of this study were from first grade students of Imam Hossein Shahed elementary school in Tehran, Iran, 2016.

BMI is useful in clinical practice and in epidemiologic studies, but it suffers from a number of limitations. Principally, it does not distinguish between increased mass in the form of fat, lean tissue or bone, and hence can lead to significant misclassification. Since the pathology associated with obesity is driven by the excess fat mass<sup>12</sup>.

Comparison between studies was difficult because of differences in anthropometric indicators and cut offs used to define obesity which resulted in a broad range of obesity prevalence in both childhood and adulthood<sup>13</sup>.

The relationship between weight changes in childhood and obesity in childhood and obesity in adulthood has been addressed in several studies<sup>14-16</sup>. These studies used different statistical and data analysis methods, and their findings are not directly comparable. Miller et al. reported the relationship between weight gain from birth to age 3 years with weight for height at age 22<sup>15</sup>. The correlation was 0.35 for girls and 0.09 for boys. In contrast, Charney et al. showed the rate of weight gain during the first 6 months of life was not associated with adult obesity after adjustment for weight at 6 months<sup>17</sup>.

Serdula et al. concluded in their study that epidemiologic studies consistently find a positive association between anthropometric measures of obesity in childhood and those in adulthood. Among obese preschool children, 26 to 41 % were found to be obese as adults, and among obese school-age children, 42-63 % were obese as adult. Overall, the risk becoming an obese adult was 2 to 6.5 fold higher for obese children than for nonobese children<sup>18</sup>. In a study which have been conducted by Abraham and

colleagues showed higher rates of hypertensive vascular and cardiovascular renal disease among overweight as children<sup>19</sup>.

Rolland- Cachra and co-workers examined W/H<sup>2</sup> at 6 month intervals from 1 to 21 years of age<sup>16</sup>. They concluded that the younger a child was at the lowest point of BMI, the higher the obesity at adulthood.

Determining the clinical value of thinness categories is complicated by several factors i.e. changes in body composition with growth<sup>20, 21</sup>. Variation in body frame size, relative leg length or muscle mass across populations<sup>22, 23</sup> and differences in timing and tempo of adolescent growth spurt, peak height velocity and sexual maturation across populations.

Since extensive data are available on frequencies of childhood obesity and overweight, very few publications report frequencies of thinness in different studies. Pascal Bovet et, in study which conducted in 2010 showed that the prevalence of thinness was 21.4%, 6.4% and 2.0% based on the three IS cut-offs and 27.7%, 6.7% and 1.2% based on the WHO cut-offs. The prevalence of thinness categories tended to decrease according to age for both sexes for the IS reference and among girls for the WHO reference<sup>24</sup>.

A serious limitation of the literature is low study population which we can observe in the most of the studies which were conducted among schoolchildren. The wide ranges of estimates in different literatures are due to differences in study designs, the ages at which participants were measured, and the time interval between assessments as well as cultural or temporal differences.

## Conclusion

In conclusion, effective programs to prevent adult overweight and obesity need to be developed. Such programs would emphasize good nutritional and exercise habits in all children, whether or not they are obese. The prevalence of thinness tended to change according to children's age and there were some differences according to sex. Similar studies should be conducted in other populations in the region. More generally, findings in diverse populations should be reviewed in order to provide general guidance for health professionals on the use of these thinness standards. The findings suggest that parents

and school staff have sophisticated views on the possible causes of childhood overweight and obesity which encompassed behavioural, structural and social causes.

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