COMPARISON THE ANTHROPOMETRIC CHARACTERISTICS OF 7-14 YEARS OLD GIRLS WITH NCHS STANDARD

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Abstract:

Purpose: The purpose of this study was comparison the anthropometric characteristics of 7-14 years old girls in Kashan city with NCHs standard. For this purpose 900 girl students (450 people from elementary school and 450 people from middle grades) using cluster sampling method form Kashan schools were chosen. Anthropometric characteristics included height, weight, body mass index (BMI) and body fat percent were measured. Then data by single-sampling t-test were analyzed (P<0/05).

Results: The results showed that the average of height, weight and BMI in subjects were significantly lower than the standard values (P<0/05). Body fat percent in 8-14 years old range were significantly less than the standard values (P<0/05). But the age group of 7 years old had no significant difference with the standard value. The findings also showed that the subjects didn't have good physical development. It was probably due to nutritional disorders and physical inactivity.

Discussion and conclusion: These evidences suggested that to achieve international standards about above mentioned factors and to meet the needs of health in these age groups, following up and controlling the development process, performing regular physical activities, as well as have good nutrition are very essential and important.

Keywords: anthropometric characteristics, girl students, NCHS standard

Introduction

The growth term is used for a collection of body organs changes that cause a baby become an adult. Because, growth and evolution are the best evidence for health determination, paying attention to the growth indices is very essential. The growth can

be considered as increasing of body size, while the body development can be attributed to the body quality changes, like change in activity of different systems of body. The natural growth of body is depends on different factors that the most important factors include nutrition, environment, lineage and injuries which resulted from different diseases. The science of anthropometry is a branch of physical anthropometry that studies human body size and dimensions (10). Because of the increasing importance of this science and the intense need of the country, this subject has been considered particularly in recent years, so that anthropometry discussed in medical commission of scientific investigations council of the country in 1990 that was organized for determination of the priorities of medical group.

After professional studies and because of the intense need of the country to anthropometric professional information unanimously the anthropometry became the second radical priority among 6 discussed research priorities. WHO does not recommended the preparation national and believes that genetic differences often appear during adolescence [3]. Experiences of different countries showed that all of the kids before 5 years old have the same growth potential inherently in the optimal condition. According to this, for years the WHO has been suggested that the standard NCHS curve can be used for assessing the growth condition of children in all countries. Studies that have been done in Iran have shown that children and adolescent in affluent classes and in social and health environment have been grown in comparing with NCHS standard had favorable and acceptable physical growth.

In Iran in the field of comparison anthropometric characteristics of children and adolescent with the standard norms several studies have been conducted; in this context the following examples can be mentioned: Montazerifar et al., (2003) investigated the pattern of growth in 11-19 years old girls in Zahedan city. Their results showed that average of height, weight and BMI of participants were less than standard norms [7]. Mahyar et al., (2005) compared weight, height and BMI of 12-18 years old girls in Qazvin city with international standard values. They founded that all subjects had less mean height than standard value but the average of their BMI was more than the desirable level. On the other hand, average of weight only in 15-18 years old group was less than the standard value [6]. In another study Aminoroaya et al., (2000) investigated the growth of girls 6 to 8 years old in Isfahan. Their findings showed that the weight and height of the girls were in the optimal range [1]. Valizade et al., (2005) performed a study in order to determining the anthropometric indices in girl high schools of Zanjan city.

The results of current study and other same studies show that height and weight of girls in Iran are lower than the world standard, but these differences are not

significant, but according to NCHs curve, underweight and stunting are prevalent in Iran very much. However, in compared with NCHS underweight and stunting are high in Iran [11]. Tartibian and Akbari (2008) compared anthropometric characteristics of female students 11 to 17 years of Urmia city with the global standard. The results showed that the average of height, weight and BMI index in this group were less than standard values. Because of Iranian mixture lineage and also due to diversity and different dimensions of the body in different regions of Iran, in this context more studies should be done and anthropometric indices in different Iranian strain should be measured and then the average of them should be compared together [10]. After attaining one average for variable in Iranian lineage, these values must be compared in different tribes [10]. Therefore, purpose of this study was measurement of anthropometric characteristic of 7-14 years old girls in Kashan city and comparing it with NCHS.

Methods

This study was descriptive and has been done with fieldwork method. In this study, 900 persons (450 persons from elementary school and 450 persons from high school) were chosen randomly. From elementary and middle grade schools of Kashan using cluster sampling method and from each of 4 geographical directions (north, south, east, west) and center of the town samples were selected. According to the number of study sample 70 persons from elementary school and 50 persons from middle grade schools were examined randomly who had no effective disorders on growth such as metabolic, muscular – skeleton and neurologic and any chronic diseases according to school hygiene teacher and hygienic records.

In this study, anthropometric measurements, were included height, weight and body for percent (sub-scapulars and brachial). The fat percentage was estimated using height and weight of samples, and BMI and putting the values of brachial triceps muscle and subscapular muscle in the formula body fat percentage was calculated. Finally, these data were compared according to the NCHs world standard norm and the results were analyzed. Given the number of sample, in elementary school 70 students and in middle grade 50 student from each school among those who had not disorders that could have negative effect on growth (such as metabolic, musculoskeletal, and neurologic disorders) and also according to school health teachers and their health records did not have chronic disease were randomly examined. Anthropometric measurements in this study included height, weight and body fat percentage (triceps arm and the scapular muscles), respectively. Using height and weight, BMI was

calculated and also with putting the values of triceps subscapular muscle in the formula body fat percent was calculated. Finally, the data were compared with international standard NCHS norm.

Statistical methods

In the present study to describe and explain the findings descriptive statistics include tables, charts, average, and standard deviation were used. To analyze the data, inferential statistics including single-sample T-test was used. The findings of the study were assessed at level (P<0.05). The SPSS 16 software for data analyzing and Microsoft excel for drawing the charts and tables were used.

Results

The results of this study showed that the mean of height, weight and BMI indices in 14-7 years old female students of Kashan city were significantly lower than the NCHS standard values (P=0/001) (figures 1, 2, 3). The body fat percentage incidences in the age groups of 8 to 14 years were significantly lower than the standard values (P=0/001). But in the age group 7 years this difference was not statistically significant (Figure 4).

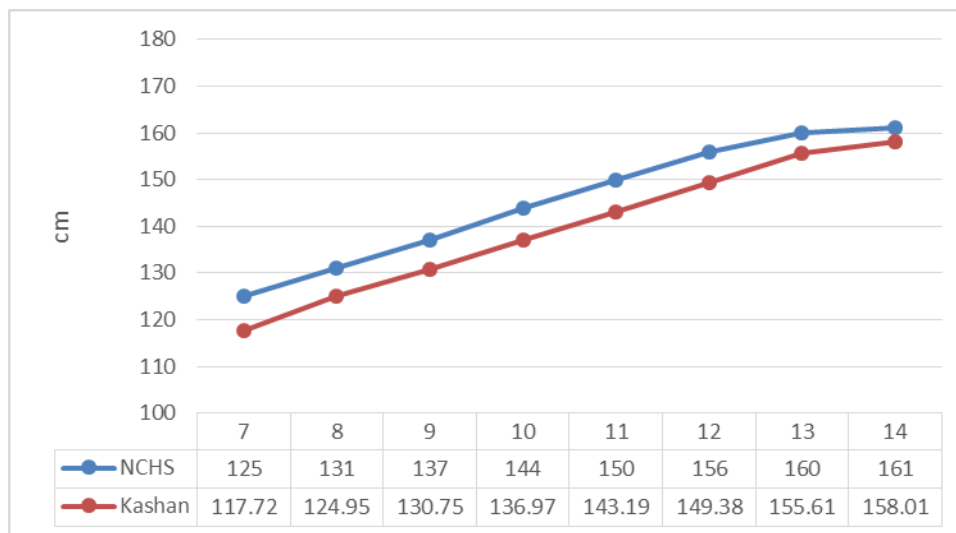| cm	7	8	9	10	11	12	13	14
NCHS	125	131	137	144	150	156	160	161
Kashan	117.72	124.95	130.75	136.97	143.19	149.38	155.61	158.01

Figure 1: Comparison height index of 7-14 years old girl students of Kashan city with NCHS standard

	7	8	9	10	11	12	13	14
NCHS	27	32	35	41	47	52	57	62
Kashan	21.36	26.56	29.52	33.01	38.3	43.68	52.24	54.91
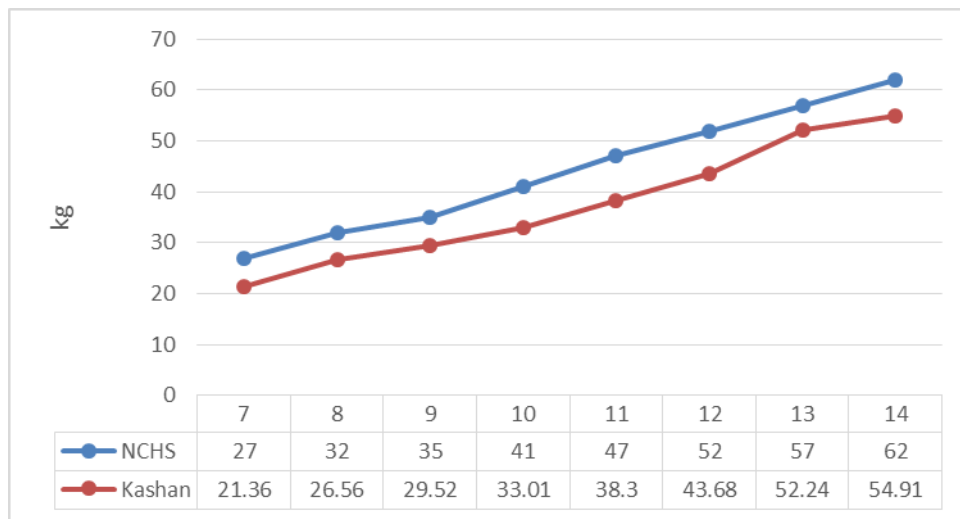
Figure 2: Comparison weight index of 7-14 years old girl students of Kashan city, with NCHS standard

	7	8	9	10	11	12	13	14
NCHS	17	18	19	20	21	21.5	22	23
Kashan	15.11	16.56	16.83	17.26	18.3	19.2	21.21	21.79
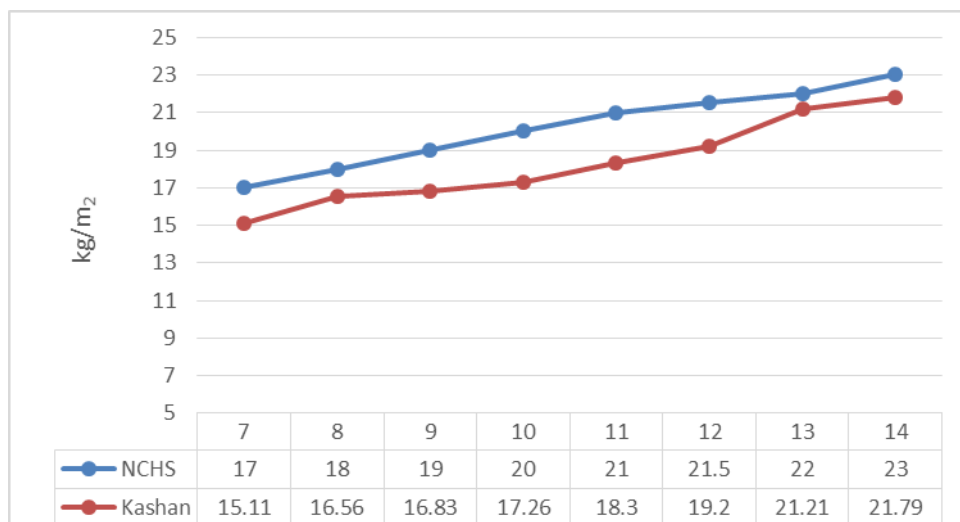
Figure 3: Comparison BMI index of 7-14 years old girl students of Kashan city, with NCHS standard
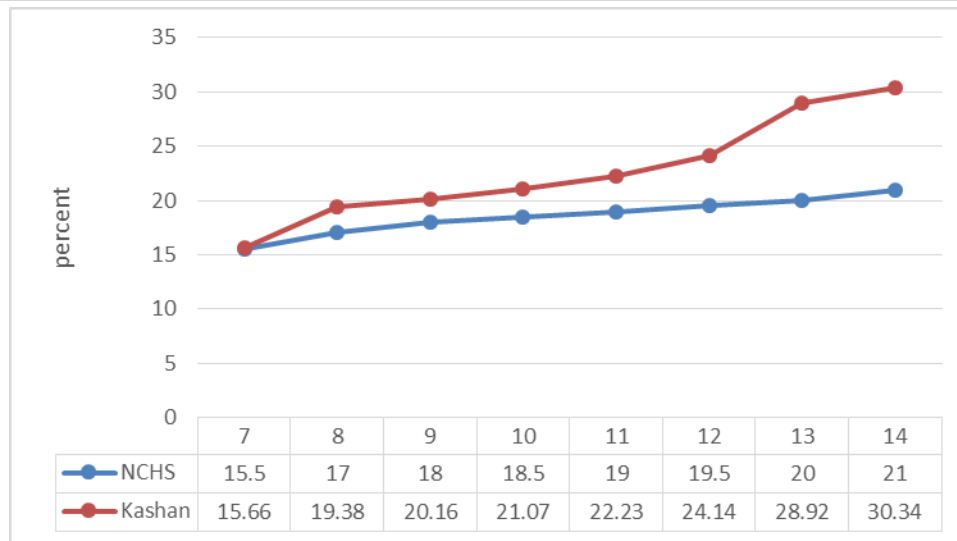
Figure 4: Comparison fat percent index of 7-14 years old girl students of Kashan city, with NCHS standard

Discussion and Conclusion

Findings of this study indicated that average of anthropometric indices of height, weight, body fat percentage and body mass index in 7 to 14 years old girl students of Kashan city were significantly lower than the NCHS standard norm. Few studies about thickness of subcutaneous fat in children and adolescents have been conducted. Most studies were measured height, weight and BMI indices. The results of Tartibian et al., (2008) in Urmia city showed that approximately in all age groups except the 14 years old group the anthropometric characteristics were significantly lower than the NCHS standard.

Karamizadeh et al. (2003) investigated some structural anthropometric of 11-14 years old girl students in central areas of Iran. Then they reported that the average of height and weight of the participants were very much lower than the standard values [4]. Valizadeh et al. (2005) carried out a study on middle grade girl schools in Zanjan that their findings showed significant reduction in weight and height indices relative to standard norms. Findings of present study about height, weight, and BMI indices were similar to Nemati et al. (2009) and Mousavi Jam et al. (2005) that reported the average of above mentioned indices were less than standard norms [8-9]. We could not found any study that compared the body fat percent with standard norm. Most studies have been examined weight, height and BMI indices. Many reasons can be mentioned for lowering the anthropometric characteristics in Iranian students compared with standard norms that the most important factors include lineage, nutritional problems, environmental conditions and inactivity can be noted. These factors probably caused by the lack of

attention of parents and organizations to children's nutrition, lack of physical activity during adolescence and also family economic weakness.

A study in Nepal (2005) on 14-19 old years was carried out. Findings of mentioned study indicated that anthropometric parameters related to many factors such as nutrition during infancy, family education and economic situation of the family [5]. In Qatar, a similar study was carried out on 6-18 years old girls. The results showed that the average of weight of this age range was greater than the value of NCHS standard but the average of height of them was less than the standard value [2]. Studies in Qatar, USA, Italy, France and Punjab showed that overweight among girls especially among kids in comparison with the standard value is increasing. Different factors such as inactivity, consumption of fatty food, consumption junk food, can have an important role in gain overweight [10].

Finally, it is important to be noted that to obtain a better and more practical result more longitudinal studies should be conducted in the other cities and provinces. Totally, the results of present study showed that 7 to 14 years old girl students of Kashan city don't not have sufficient physical growth and there are significant differences between their anthropometric characteristics with NCHS international norms. Probably students in this city are faced with nutritional and inactivity problems. The most important factors that will make differences in height, weight, and lineage indices are nutritional problems, environmental conditions and physical inactivity. Follow up and control the process of growth, as well as having regular physical activity and good nutrition to achieve the standard values about above mentioned factors in girls, is very necessary and important.

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