

The effect of body composition value in 12-14 aged teenagers' physical fitness

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Abstract

In this study of the effect of body composition value on 12-14 aged teenagers' physical fitness; testing and evaluation of height, weight and body composition of different age groups are shown separated. According to evaluation of children's physical fitness; there is a remarkable difference between the height of the group doing sports and the one do not. There is no big difference of evaluation between the same groups of children. Also, there is a big difference of height and body fat percentage results between two groups. Between groups of age 12 and 13 doing sports; there are differences of height and weight however; there is no difference of body fat percentage. Between group of age 12 and 13 not doing sports; there is a significant difference of height and weight, however; there is no difference of body fat percentage. Between group of age 13 and 14 doing sports; there is no difference of any values except height and weight. Between group of age 12-14 doing sports there are remarkable differences of height, weight and body fat percentage. However there is no difference between the one who are not doing sports. Physical fitness test results are similar to other studies and other country norms.

Keywords: Children, doing sports, physical fitness.

INTRODUCTION

Physical Education and Sports are necessary for healthy life (3). Determining the physical fitness of children is important to create general country norms. It is important to recognize successful athletes of the future at early age. Therefore; In Europe there are lots of studies which determine the physical talent of children. One of them is EUROFIT tests. Wide segment study of the development of the children and their physical fitness are limited. However; these studies may lead to many areas from health and sportive performance to education (4). In this study, subjects are 12-14 years old male teenagers doing and not doing sports who lived in Konya during 1990-1991 academic year. Height, weight and body compositions of the subjects are determined and compared to each other.

Body composition is mainly composed of proportionally leaguings together of fat, bone and muscle cells and other organic matters as well as extracellular liquids (13). Body composition gives information about the psychological structure of the body. 60% water, 0.5% carbohydrate, 16% protein, 4,5 % minerals and 15 to 20 % fat constitute the body composition of an adult (12). Although people's

bodies seem similar to each other physically, every person has his/her own different and unique physical composition. Nearly 10% of a person's body weight is cartilage, tendon and skin and 40% of it is skeleton muscles and 10 % is bones. Fat storage, internal organs and endocrine glands form the remaining 40 percent. Body composition varies due to factors like diet, genetics, age, gender and climate. While almost 60% of the body weights of young adult male athletes is water, the percentage of this with young adult female athletes is 50(13). During the first periods of life, body composition is different from that of an adult. The water levels of babies and children are higher than those of adults. Furthermore, this level goes down as people age. In terms of body composition, male and female athletes have tissular differences. When compared with females, males have longer, heavier and bigger muscle structure besides having longer and thicker bones (12).

According to World Health Organization (WHO), physical suitability is the ability to do a muscular activity successfully. Physical suitability can be conceptually defined as the ability to do muscular activities successfully (6,5,16). Disease

Control Center defines suitability as a series of qualities related to the physical activity performing skill that people have or obtain (6). Physical suitability is not only an active life style but also an important health prescription for the young and old individuals. Researches show that being active and fit decreases the risk of death caused by heart diseases (11). Physical suitability is highly important for children to develop a positive attitude towards their bodies, to have physical situation awareness and to maintain their sports and exercise lives (14).

MATERIALS & METHODS

The 65 male students doing sports and not doing sports, who studies in Konya Karma Secondary School have been taken as subjects in this study. Students who are doing sports are 32 and the ones who is not doing sports are 33. 15 of the students who are doing sports are 12 years old, 6 of them are 13 years old, 11 of them are 14 years old. 13 of the students who are not doing sports are 12 years old, 11 of them are 13 years old, 9 of them are 14 years old. Quantifications are completed in 3 days. The subjects participated in the measurement with their shorts and t-shirts before the measuring of their health control was made and they had been informed about the test. Height measurement was taken while standing; hips, back, and cushions touching the wall, weight measurement was taken with electronic scale device. All skin thickness measurements are made with Lange Skinfold Caliper tool and the skinfold thickness was measured by the same person taking two measurements from the skinfold instrument (Holtain), abdomen, triceps, thigh and back (subscapular) regions. If there was more than 5% difference between two measurements, the measurement was repeated. For measurement, the skin and subcutaneous fat were removed intentionally by holding the head and the index finger, the arms of the Skinfold instrument were placed in the skin fold and read in calibrated millimeters. Abdominal measurement is 2 cm from the side of the rectum in the vertical direction; Arm measurement perpendicular to the back of the arm, from the aorta (over the triceps muscle); Thigh measurement in the vertical direction from the front, middle (over the quadriceps femoris muscle) thigh; The back measurement was taken 1 cm below the bottom of the scapula.

Statistics

The values were presented as a mean and standard deviation. These values were separately presented for those doing sports, those not doing sports in all the age groups and 12, 13 and 14 age groups. The statistical differences between the groups were investigated by using "t" test. Statistical significant level is 0.05. The calculation of the correlation coefficient between variables was performed by using Pearson Product Moment Formula.

RESULTS

In this study, data obtained are shown in tables separated by ages and by doing sports and not doing sports.

Table 1. Physical properties of the subjects.

Variables	Groups	Sedentary	Exercising
Height (cm)	Mean	155.51	161
	Std. Deviation	9.56	10.15
Weight (kg)	Mean	45.09	47.81
	Std. Deviation	11.85	8.68
Body Surface Area (m2)	Mean	1.40	1.47
	Std. Deviation	0.20	1.72

Table 2. Height, weight and body surface areas of the subjects according to their age groups.

Variables	Groups	Sedentary	Exercising
Height (cm)	12 age group	148.76	153.46
	13 age group	158.0	162.83
	14 age group	162.22	170.27
Weight (kg)	12 age group	39.61	42.13
	13 age group	47.0	50.16
	14 age group	50.66	54.27
Body Surface Area (m2)	12 age group	1.28 ± 0.17	1.35 ± 0.10
	13 age group	1.43 ± 0.17	1.51 ± 0.13
	14 age group	1.52 ± 0.20	1.62 ± 0.14

Table 3. Body Fat Percentage of Different Age Groups (%)

Groups	Sedentary	Exercising
12 age group	16.76 ± 6.36	17.8 ± 4.27
13 age group	19.05 ± 7.42	19.18 ± 5.24
14 age group	16.77 ± 5.76	15.9 ± 5.02
All Subjects	17.77 ± 6.51	17.72 ± 5.02

DISCUSSION

These physical characteristics and test results obtained in this study are shown in Table 1; There is P<0.05 level difference between sedentary group and exercising group. This result is 161cm for exercising group, and for sedentary group the result is 155.51

cm. Same groups weight average is 47.81 kg, and for sedentary group it is 45.09 kg. There are no remarkable differences between these values. In this study of İşleğen et al. (7) 12-14 year old football players' average height is 154.9cm and sedentary groups' average height is 155.37cm. Average weight for football players is 43.25 kg and for sedentary group it is 44.64 kg.

According to Baydil's study; the age of male students' is 12.44 years, height is 145.28cm, body weight is 37.19kg (2). In the study of Uzunçan (17) in Konya; 12 year old male students height is 144.27cm, weight is 35.91. In Akgün's study (1) in İzmir, 12 year old male students' height is 149.70cm, weight is 39.23kg. All these values are not different than our study results.

Height and weight are physical measurements. Nutrition, environmental factors and genetic factor may affect growth (7). Generally genetic factors are more effective than environmental factors on growth. Women are 10-15cm shorter than men, at the age of 15 men has the same weight as women and out weight (10).

In the study of Wright et al. (18); Height, weight and body fat percentages of children aged 12-17 are; for boys 157.6cm, 43.6kg. and 18.4% and for girls 156.6cm., 45.5kg. and 26%.

The mean body surface of sedentary group is 1.40 m², exercising group is 1.47 m² (Table 1). There is remarkable difference between 12-13-14 aged group of sedentary group however, 13-14 aged group of sedentary group there is no remarkable difference. There is also remarkable difference between 12-13 and 12-14 aged exercising groups. Between all the groups there is no remarkable difference on mean body surfaced (Table 2).

In our study; body fat percentage of sedentary and exercising group is 17.77 ± 6.51 and 17.72 ± 5.02 . Body fat percentages are shown in the table for all different groups and subjects (Table 3). According to body fat percentage results there are not any remarkable differences between 12-13 and 12-14 age groups.

According to study of Akgün et al. (1) adolescent aged swimmers' body fat percentage is 11.3% for boys and 16.6% for girls. Body fatness increases with age and it is higher at women (9). In this study; body fat percentage of sedentary male result is 17.77%, which is a high value.

In Baydil (2) studies; body fat percentage of 12-14 year old male students is found 8.95%, In Şenel (15) studies; body fat percentage of 13-16 year old male students is found 13.02%. In Zorba et al. (19) studies; body fat percentages of 12-15 year old male is found 5.86%. All these studies does not have any significant relation with our work.

Consequently, test parameters, which are made to determine physical fitness, are similar to other studies and national norms (7).

As a result, height and body fat percentage of all subjects is different between sedentary and exercising groups. For weight the result is not the same. Height and weight is used to determine general health and nutrition averages (especially for adolescents). Nutrition, environmental and genetic factors affect growth(8). Generally; impact of genetic factor are more effective than environmental factors. Women are 10-15cm shorter than men, at the age of 15 men has the same weight as women and out weight (10).

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