10 Weeks of Football Practice's Effect on Body Composition and Some Anthropometric Parameters in Children

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Abstract

Aim: The purpose of this study is to search the effect of regularly conducted football practices on body composition and some anthropometric values in children.

Material and Method: 21 male volunteers who reside in Sanliurfa and study at elementary schools with mean age 11,33±0,48 (years) and mean height 143,48±6,89 (cm) were involved in the study. Subjects' height, body weight (BW), body mass index (BMI), skin fold thickness (SFT), body fat percentage (PBF), diameter-circumference (cm) values were measured as being the 1st measure before testing, the 2nd measure after the end of 5th week and the 3rd measure after the end of 10th week; and the measurements were recorded. SPSS-16 packet software was used to process the data obtained from the measurements. To indentify the relevance among three average measurements; Repeated Measure ANOVA/Benferroni test was applied and level of significance was chosen as 0.05 and 0.01.

Findings: Experiment group's mean age is observed to be 11,33±0,48 (years) and mean height to be 143,48±6,89 (cm). In addition, the difference between average measurements of body weight (BW) and body mass index (BMI) parameters is observed to be statistically significant ($p<0,01$) (Table 1). Regarding the average measurements of body fat percentage PBF (%) and Q.Femoris circumference parameters in experiment group; a ($p<0,01$) level of statistical significance was observed. Moreover, regarding average measurements of Triceps SFT, Suprailliac SFT, Abdomen SFT, Q.Femoris SFT, Flexed Biceps circumference parameters, a ($p<0,05$) level of statistical significance was observed. Among average measurements of Biceps SFT, Subscapula SFT, Shoulder circumference, Abdominal circumference, Hip circumference and Flexed Biceps circumference parameters, no statistically significant difference was observed ($p>0,05$) (Table 2).

Results: It is possible to say that regularly conducted football practice have positive effect on body composition and some anthropometric parameters in children aged 11-12 studying at elementary schools.

KEYWORDS: Football; Practice; Exercise; Children; Anthropometric; Training

INTRODUCTION

In most of the developing and developed countries, people start sports at an early age, and training programs based on science are applied according to age groups and developmental characteristics. It is stated that involvement of children in sport fields is significant in building a healthy and productive society. Doing exercises regularly accelerates the metabolism and thus prevents metabolic diseases and diseases related to other systems. Besides benefits for physical development, regular exercise also controls releasing of the hormones and their balance (13, 12, 18). Sports activities that a child does during pre-puberty and post-puberty period not only assists in building a healthy physical structure but also plays an important role in delaying deteriorations in physical structure at young ages. As is known, human body has an unstable system

during childhood stage when the development is in the fastest way. In this stage, if the child eats healthily, does exercises regularly, has enough sleep, is involved in activities which increase flexibility, coordination, endurance and strength; growth and development happens sufficiently and genetically owned physical structure is achieved (8) . Human body is quite skilled at increasing subcutaneous and depot adipose tissues. Body fat increases if the daily energy value taken from the food is more than the amount that the body needs. (e.g: 3500 Kkal is equal to about 0,5 kg body fat (3). To have more than enough body fat is an unnecessary and additional weight burden for the body and it affects body mechanics and poses risk factors for various diseases (2). Flexibility, velocity, strength, muscular endurance, cardiovascular endurance, coordination, body structure and composition which are all needed for aerobic and anaerobic efforts play a significant role in increasing performance. In this respect, it is stated that regularly conducted exercises increase physical and functional capacities in children (10, 20).

The purpose of this study is to search the effect of regularly conducted football exercises on body composition and some anthropometric values in children studying at elementary schools and to develop suggestions in the light of the results.

MATERIAL AND METHOD

21 male volunteers who reside in city of Sanliurfa and study at elementary schools with mean age 11,33±0,48 (years) and mean height 143,48±6,89 (cm) were involved in the study. All measurements of volunteer participants were taken in a comfortable position by a test controller, at the same hour everyday at 8:00 and the measurements were taken three times in total, the 1st measure being before testing, the 2nd measure after the end of 5th week and the 3rd measure after the end of 10th week. Height (cm), body weight (kg), body mass index (kg/ m^2), skinfold thickness (mm), body fat percentage (%), diameter-circumference (cm) measurements were taken and recorded. Through explaining the purpose of the research and the importance of it for them, the participants were supported to have an increased level of motivation and eagerness. Participants used their maximum capacity in the measurements and tests. The participants were given football training 1,5 hour in a day and 3 days in a week over the course of 10 weeks.

Height measurement: Height of the participants were measured with a digital height measurement tool with a precision of 0,01 cm.

Body Weight: Body weight was measured through a scale with a 0,1 kg precision.

Body Mass Index: Body mass index was calculated (kg/m^2) by dividing body weight value (kg) by square meter of body height measurement value.

Skinfold measurements ***(****subcutaneous adipose tissue thickness):* In order to find out the percentage of body fat, a Holtain skinfold calliper which provides a constant pressure of 10 g/sq. mm was used. Measurements were taken on the right side while subject is standing and from six standard regions of the body : biceps, triceps, abdominal, suprailliac, Q.Femoris and subscapula. Measurements were repeated until the same values were taken twice. (17, 1)

Body Fat Percentage: In order to calculate body fat index, the formula below was used. Body Fat Percentage (%) = (sum of 6 measurements (0.097)+ 3.64) (6)

Circumference Measurements: Shoulder circumference, abdominal circumference, hip circumference, biceps extension cirfumference, biceps circumference were taken through a tape and were recorded.

Statistical Analysis: SPSS-16 packaged software was used to process the data obtained from the measurements. Repeated Measure ANOVA/Benferroni test was applied to search the relationship between averages of three measurements and the level of significance was chosen to be 0.05 and 0.01.

FINDINGS

In our study, mean age of the experimental group 11,33±0,48 (year), average height of 143,48 ±6.89 (cm) was observed. Body Weight between first measurement 38,16±8,29 (kg), second measurememt 39,52±8,01(kg) and third measurement 38,66±7,52(kg) were statistically significant (p <0,01). Body mass index between first measurememt 18,34±2,53 (kg/m^2) second measurememt 19,04±2,47 (kg/m^2) and third measurement 18,62±2,24 (kg/m^2) were statistically significant (p <0,01). In the values of experimental group's biceps SFT first measurement 5,38±1,53 (mm), second measurement 5,17±1,39 (mm), third measurement 4,97±1,27 (mm) no statistically significant difference observed between them (p> 0,05). Triceps SFT first measurement 9,60±2,92 (mm) second measurement 9,42±3,08 (mm) third measurement 8,90±2,96 (mm) were statistically significant difference observed between them (p<0,05). Suprailliac SFT first measurement 7,73±5,06 (mm) second measurement 8,40±5,60 (mm) third measurement 8,23±5,54 (mm) were statistically significant difference observed between them (p<0,05). Abdomen SFT first measurement 11,78±5,83 (mm) second measurement 10,92±5,47 (mm) third measurement 10,38±5,34 (mm) were statistically significant difference observed between them (p<0,05). Subscapula SFT first measurement 8,21±4,41 (mm) second measurement 7,95±4,15 (mm) third measurement 7,66±3,85 (mm) were no statistically significant difference between them (p>0,05). Leg SFT first measurement 15,92±4,79 (mm) second measurement 15,45±5,17 (mm) third measurement 14,57±5,00 (mm) were statistically significant difference observed between them (p<0,05). PBF first measurement 9,33±2,11 (%) second measurement 9,20±1,99 (%) third measurement 8,94±1,92 (%)were statistically significant difference observed between them (p<0,01). Shoulder circumference first measurement 86,78±6,42 (cm) second measurement 86,73±6,44 (cm) third measurement 87,09±6,56 (cm) were no statistically significant difference between them (p>0,05). Abdomen circumference first measurement 65,85±7,03 (cm) second measurement 67,04±7,06 (cm) third measurement 66,85±8,53 (cm) were no statisticially significant difference between them (p>0,05). Hip circumference first measurement 82,85±7,23 (cm) second measurement 82,40±6,65 (cm) third measurement 81,54±6,71 (cm) no statisticially significant difference between them(p>0,05). Q.Femoris circumference first measurement 42,45±4,93 (cm) second measurement 43,33±4,56 (cm) third measurement 43,64±4,31 (cm) were statistically significant difference observed between them (p<0,01). Flexed biceps circumference first measurement 21,33±2,46 (cm) second measurement 21,64±2,67 (cm) third measurement 21,57±2,59 (cm) were no statisticially significant difference between them (p>0,05). Extension biceps circumference first measurement 20,09±2,23 (cm) second measurement 20,38±2,30

(cm) third measurement 20,64±2,15 (cm) were statistically significant difference observed between them (p<0,05).

Table 1: The Experimental Group Comparison of Anthropometric

Variables	Measurements	XX/SS	F	P
Age (year)	-	11,33±0,48	-	-
Height (cm)	-	143,48±6,89	-	-
Body weight (kg)	1.Measurement	38,16±8,29	6,27	0,004**
	2.Measurement	39,52±8,01		
	3.Measurement	38,66±7,52		
Body Mass Indeks (kg/m^2)	1.Measurement	18,34±2,53	6,59	0,003**
	2.Measurement	19,04±2,47		
	3.Measurement	18,62±2,24		

*** P<0.05 * * P<0.01**

Table 2: The experimental group Skinfold and diameter Measurement Comparison of Means

Variables	measurements	XX/SS	F	P
Biceps *SFT* (mm)	1.Measurement	5,38±1,53	2,20	0,124
	2.Measurement	5,17±1,39		
	3.Measurement	4,97±1,27		
Triceps *SFT* (mm)	1.Measurement	9,60±2,92	3,29	0,047*
	2.Measurement	9,42±3,08		
	3.Measurement	8,90±2,96		
Suprailliac *SFT* (mm)	1.Measurement	7,73±5,06	3,51	0,039*
	2.Measurement	8,40±5,60		
	3.Measurement	8,23±5,54		
Abdomen *SFT* (mm)	1.Measurement	11,78±5,83	4,47	0,018*
	2.Measurement	10,92±5,47		
	3.Measurement	10,38±5,34		
Subscapula *SFT* (mm)	1.Measurement	8,21±4,41	2,40	0,10
	2.Measurement	7,95±4,15		
	3.Measurement	7,66±3,85		
Q.Femoris *SFT* (mm)	1.Measurement	15,92±4,79	3,66	0,034*
	2.Measurement	15,45±5,17		
	3.Measurement	14,57±5,00		
PBF (%)	1.Measurement	9,33±2,11	6,70	0,003**
	2.Measurement	9,20±1,99		
	3.Measurement	8,94±1,92		
Shoulder Circumference	1.Measurement	86,78±6,42	1,21	0,309
	2.Measurement	86,73±6,44		

(cm)	3.Measurement	87,09±6,56		
Abdominal Circumference (cm)	1.Measurement	65,85±7,03	1,78	0,180
	2.Measurement	67,04±7,06		
	3.Measurement	66,85±8,53		
Hip Circumference (cm)	1.Measurement	82,85±7,23	2,88	0,067
	2.Measurement	82,40±6,65		
	3.Measurement	81,54±6,71		
Q.Femoris Circumference (cm)	1.Measurement	42,45±4,93	6,08	0,005**
	2.Measurement	43,33±4,56		
	3.Measurement	43,64±4,31		
Flexed Biceps Circumference (cm)	1.Measurement	21,33±2,46	1,15	0,325
	2.Measurement	21,64±2,67		
	3.Measurement	21,57±2,59		
Extencion Biceps Circumference (cm)	1.Measurement	20,09±2,23	4,84	0,013*
	2.Measurement	20,38±2,30		
	3.Measurement	20,64±2,15		

*** P<0.05 * * P<0.01**

DISCUSSION

It was observed that mean age of the experiment group was 11,33±0,48 (years) and the mean height was 143,48±6,89. In addition, the difference between average measurements of body weight (BW) and body mass index (BMI) parameters was found statistically significant (p<0,01) (Table 1). Among the average measurements of body fat percentage (PBF%) and Q.Femoris circumference parameters was significant difference observed between measurements (p<0,01). In addition, a (p<0,05) level of significance was observed between the average measurements of Triceps STF, Suprailliac STF, Abdomen STF, Q.Femoris STF, Biceps Extension Circumference parameters. Between the average measurements of Biceps STF, Subscapula STF, Shoulder circumference, Abdominal circumference, Hip circumference, Biceps Flexion Circumference parameters, no statistically significant difference was found (p>0,05) (Table 2).

In the research, while an increase between 1st and 2nd measurements of body weight and body mass index values was observed, a decrease between 2nd and 3rd measurements was identified. The reason of this, we think, is because of an increase in the muscle mass and a possible decrease in body fat percentage which occurred afterwards.

The results of the research, conducted on 36 children in total with mean age 12 and 14, in which İbiş (2002) observed a significant increase in body weight (7) and the results of the research in which Sevinç (2008) determined a p<0,05 level of significant difference as a result of football training given to children with mean age 10-14 (16) show similarities with the findings we obtained in our research.

A decrease in body mass can be achieved in two ways. One of them is the decrease in subcutaneous adipose tissue after doing exercises. This situation mostly happens as a result of trainings requiring aerobic energy. The second one is the pushing of the increase in muscle mass in skinfold where the adipose is more flexible. This situation mostly results from core trainings (11).

In our research, a (p<0,01) level of statistical significance was determined between the averages of body fat percentage (%) measurements of the experiment group. In addition, a (p<0,05) level of statistical significance was determined among the averages of Triceps SFT, Suprailliac SFT, Abdomen SFT, Leg SFT, Biceps Flexion Circumference parameters measurements.

The results of the research in which Roemmich et al. (1996) found that body fat percentage of cadet wrestlers, decreased to 7.05 (%), which was 7.54 (%) in preseason (15); the results of the research in which France (1987) found that the body fat percentage of 38 improving American wrestlers with mean age 15,3 was % 10.4 (4) ; the results of the research which was conducted by Karakaş et al. (2003) to search the effect of sports and physical exercise on body mass index and body fat percentage and in which they compared body fat percentages and body weight of the sportsmen and sedentary, and stated that these characteristics are higher in sedentary(9); the results of the research, conducted by Yalaz et al. (1999) on children aged 10-12 after an exercise program, in which they found that m.triseps, m.biseps brachii and m.triceps rurae skinfold in males decreased (19); the results of the research, conducted by Doğan (2002) on basketball players, in which he determined after a 6 weeks exercise that experimental group abdominal value was 6,78±1,77 mm and biceps value was 3,74±0,93 mm; control group abdominal value was 9,58±4,30 mm and biceps value was 4,73±1,63 mm (21); the results of the research, conducted by Gorely et al. on 589 children aged 7-11 who are doing activities, in which they found significant differences in body fat percentage parameters (5); the results of the research, conducted by Roudsepp and Jurimae (1997), in which they found statistically significant differences between adipose tissue, physical activity and fitness in prepubertal girls (14) support the study we conducted. The findings we obtained, in the light of the information that physical activities done with aerobic-intensity at least three times in a day have a positive impact on body composition, show similarities with the literature.

As a result, it is possible to state that regularly conducted football trainings have a positive impact on the body composition and some anthropometric parameters in children studying at elementary schools.

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