TURKISH JOURNAL OF SPORT AND EXERCISE
www.turksportexe.org
Year: 2013 - Volume: 15 - Issue: 3 - Pages: 7-10
ISSN: 2147-5652

The effect of regular basketball education on children's some anthropometric parameters and vertical jump

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Abstract

This study aims to examine the effect of 12-week regular basic basketball trainings on anthropometric measurements and vertical jump of children aged 8-10. The experimental group of the research consisted of 40 children whose average age was 9.04 ± 0.77 years and the control group consisted of 38 children whose average age was 8.97±0.72 years. Ability selection was made in order to determine these 78 children forming the experimental and control group. Pretest measurements of 40 children in the experimental group were made before basic basketball trainings that would last for 12 weeks and posttest measurements were made after trainings. The same measurements were taken from the other 38 children in the control group, yet any training was not applied to them. Basic basketball education was given in line with complete recovery principle to the experimental group for 12 weeks-three days a week and 90 minutes a day. SPSS 15.00 package program was used in order to evaluate the data obtained from the study and form the tables. Student's t test was used in the comparison of the experimental and control groups. Also, Wilcoxon test was used in the comparison of each group's pretests and posttests. The values of $p<0.01$ and $p<0.05$ were accepted as significance level for all statistical analysis. As a result, there was not a significant differences found between anthropometric measurements and vertical jump of the children after the basketball training.

Keywords: Basketball education, training, anthropometric measurements, vertical jump.

INTRODUCTION

Ball games require abilities that include physical, technical, mental and tactical features. For this reason, players must have physical abilities in order to be ready for defense and attack in the game. These abilities are very important to win in basketball (19). Dribbling, passing and shooting are the fundamental skills in basketball. Fundamental skills that we call the base of basketball are the applications that all players have to learn (7). As known, players perform many movements and short distance race speedily during a basketball game. They aim to attack the opposite team with sudden and fast attacks by increasing the tempo of game. Also, they have to be successful in defense with the same base (10).

The determination of anthropometric and physiological profiles can contribute to the selection of criterions necessary for success in basketball players who are at early ages (4). Regular activities done in childhood have positive effects on physical and emotional health (14,20). The short and long-term effects of physical activities in this process continue during the adulthood as well (18). Even though physical activity has a lot of benefit in terms of health, it is seen that physical activity level of children in many countries is low (2). It is very important to make children meet physical activities at early ages and make them be used to a speedy life. The complete grasp of athletes' physical and physiological features contributes to activities, especially in terms of training science. The obtaining of success that is wished is possible with positive effects of studies done (12).

The development of player's features such as strength, speed, flexibility, ability and stamina can be provided by training particular to the sports branch. As a result of this, speed and higher-jumping of basketball players get easier. This attracts people because basketball is a watching game and its score can change all the time. Basketball trainers say that vertical jump and leg strength are the basis of high performance (6).

The development of muscle mass and of using this muscle mass are observed as a result of training, which affect the match performance positively (9).

Also, physical fitness values including athletes' physical, physiological and anthropometric features are very important in ability selection. According to Hoare, ability selection programs focus on individual sports with physical-physiological features and are not taken into account in determining performance in team sports (5).

Researchers tend to concentrate on high-level athletes in order to determine the necessities for success and to define this feature physically, physiologically and psychologically (16). In this sense, the research aims to determine the change in anthropometric and vertical jump values of basketball players aged 8-10 after a 12-week training program.

MATERIALS AND METHODS

78 voluntary male children (40 are subject and 38 are in the control group) aged 8-10 attended the research. The average age of students in the experimental group was 9.04±0.77 years and the average age of students in the control group was 8.97±0.72 years. Basic basketball education was given to the experimental group for 12 weeks-three days a week and 90 minutes a day

Education was given in line with complete recovery principle. On the other hand, the control group did not make a regular exercise. Pretest and posttest measurements were taken from the groups. The body weight of the participants was measured by electronic scale at 0.1 kg precision with minimum clothing. The participants were with minimum clothing while their body weight was measured (21). Circumference measurements were taken from biceps at extension and biceps and forearm areas at flexion. Caliper was used in caliber measurements and measurements were recorded at 0.1 precision levels (17). The vertical jump measurements of all participants were made by Takei Physical Fitness Test Jump (T.K.K. 5106 Model-Japan). Participants were wished to jump upward at a position in which hands were in the waist area, feet were open at shoulder width, the upper area of the body was straight and knees at a half-bended position. This was made for two times and the best degree was recorded as cm.

SPSS 15.0 program was used for statistical analysis. Arithmetic averages and standard deviations of all variables were measured. Student's t test was used in the comparison of the experimental and control groups. Also, Wilcoxon test was used in the comparison of each group's pretests and posttests. The values of $p<0.01$ and $p<0.05$ were accepted as significance level for all statistical analysis.

RESULTS

As a result of our study, the average age of the experimental group was 9.04±0.77 years, the average height of them was 124.89±4.77 cm and the average weight of them was 26.95±5.02 kg. The average age of the control group was 8.97±0.72 years, the average height of them was 124.65±5.83 cm and the average weight of them was 26.66±6.48 kg.

Table 1. Demographic features of Experimental and Control Groups

Variables	Groups	N	Mean ± SD
Age	Treatment	40	9.04 ± 0.77
	Control	38	8.97 ± 0.72
Height	Treatment	40	124.89 ± 4.77
	Control	38	124.65 ± 5.83
Weight	Treatment	40	26.95 ± 5.02
	Control	38	26.66 ± 6.48

There was not found a statistically significant difference between the anthropometric measurements and vertical jump values of the subjects. There was not found a significant difference between pretest and posttest average values of hip, femur, calf and Bi-iliac. There was not found a statistical difference between the pretest and posttest average values of vertical jump.

DISCUSSION

This study showed that 12-week basic basketball training did not have any effect on the anthropometric measurements and vertical jump values of children aged 8-10. There are studies that support our study in this field as well as there are studies that had opposite results.

It was observed that the results of researches evaluating the jump performance in children were contradictory. Even though the same training program is applied, the effect of training can differ in a group. Examination of this case is important for children (1).

Table 2. The change of pre-measurements and post-measurements of the experimental and control groups.

Variables	Groups	Before	After	P value	P Interaction (After x Before)
Hip Circumference	Treatment	70.3 ± 6.7	70.8 ± 6.0	0.684	0.399
	Control	70.2 ± 6.8	69.0 ± 6.5	0.466	
Femur Circumference	Treatment	30.0 ± 3.1	30.2 ± 3.3	0.843	0.620
	Control	32.3 ± 4.1	31.9 ± 4.1	0.657	
Calf Circumference	Treatment	26.0 ± 3.0	26.1 ± 3.0	0.868	0.614
	Control	26.2 ± 5.6	25.5 ± 2.6	0.532	
Bi-iliac Caliber	Treatment	19.3 ± 1.5	19.6 ± 2.4	0.443	0.237
	Control	20.2 ± 2.3	19.0 ± 3.3	0.075	
Vertical Jump	Treatment	17.7 ± 6.3	19.6 ± 5.3	0.895	0.725
	Control	19.7 ± 5.9	18.5 ± 5.9	0.598	

Mero et al. examined the different jump performances of weight lifting; long-distance and short-distance athletes aged 10-13. In this study, the data obtained from successful athletes were compared with the data of the control group children who were at the same age. There was not found a significant difference between the squat and active jump values, yet there was found a significant difference between the depth jump values (8)

Pekel et al. said that there were usually positive relationships between the caliber, circumference and length measurements and speed, power and strength test performances in male and female children aged 10-13 (11).

Savucu et al. observed developments in strength, speed, stamina, vertical jump and anaerobic power of children who play basketball at junior, star and young team categories in parallel with increase in age or category (12).

Çakır et al. found in their study on male and female children aged 11, 12 and 13 who did training and did not training that jump performance was better in the group that did training and that this case was statistically significant (1). The change rate between the vertical jump values in the group that did short-distance race and weight lifting training was compared with the data of the control group and statistically significant difference was observed (3).

Significant increases in the vertical jump values of children who did taekwondo sport were found. Also, significant differences were found in the circumference and width values of the athletes. When similar researches are examined, it is seen that vertical jump values of the same age group were different (15).

In this study, there was not observed a statistically significant difference between the anthropometric measurements and vertical jump values of the children in the experimental and control group. Despite the fact that there was not a statistically significant difference, there was a change in the numerical values. As this change occurred within both groups, it can be said that development process can affect children's anthropometric measurement values. Numerical increase in the anthropometric measurements of children who did training can be explained by increase in muscle hypertrophy. Also, as there was increase in the vertical jump value, it can be said that training had positive effects on vertical jump.

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