

Full Length Research Paper

The effects of basketball basic skills training on gross motor skills development of female children

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The purpose of this study was to investigate the effects of basketball basic skills training on gross motor skills development of female children in Turkey. For that purpose, 40 female children took part in the study voluntarily. Basketball basic skills test was used to improve the gross motor skills of the female children in the study. Also, observation form was used to determine changes with respect to the gross motor skills of the female children in the study. Locomotor, manipulative and balancing trainings in Basketball Basic Skills Test lasted for 90 min a day, 2 days a week for 12 weeks. Descriptive statistics and paired samples t test were used to analyze the data collected from the pretest and posttest. The data were analyzed by using SPSS 18.0 Package Program. Level of significance was determined to be 0.05. As a result of this study, it was found that there was a significant difference between pretest and posttest for all parameters ($p < 0.05$).

Key words: Psychomotor development, motor skills, basketball, female children.

INTRODUCTION

Development is a behavior pattern (Ulgen, 1997), and also it is a complex phenomenon that integrates many structures and functions with respect to real life. Because of this integration, stages of the development process affect next stages of it directly. Development of a person is a regular and continuous change composed via learning, life and maturation (Ozer and Ozer, 2012). In the development process, all people investigate symbols in their environment by using capabilities of perception, thought and emotion (Ulgen, 1997).

Psychomotor generally describes actions that require coordination of various parts of the body. Executive control is needed to facilitate such coordination of

multiple body parts (Cheong, 2007). This view was reinforced by Jacko and Vitense (2001) who posited that cognitive function is a component of psychomotor ability, and that psychomotor ability is in fact composed of a combination of cognitive, perceptual, and physical abilities (Cheong, 2007). Motor development are closely related to physical and mental health (Roeber, 2012) because motor development is an organism movement process as parallel to physical growth and central nervous system (Sari, 2005). Understanding psychomotor development provides opportunities to improve movement abilities and to increase performance. These improvements provide positive self-esteem and emotional

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stability to people (Zeybek, 2009; Muratli, 1997). Motor skills may vary depending on individual differences and age (Gurocak, 2007). In this way, purpose for motor development programs should be composed by determining suitable time and form of activities for different age groups (Ozmun and Gallahue, 2005). People use psychomotor features to improve strength, endurance, speed and coordination (Cakiroglu, 1997). Psychomotor features cover genetic abilities and abilities gained in process of development and maturation (Gunsel, 2004). In the context of development and movement, coordination forms qualities of a movement or sporty technique. The more children improve their skills, the more fluency, dynamics, rhythm and reaction of them improve in positive direction (Yorulmaz, 2005). Development of motor abilities is related to individual's development as mental, emotional and social. Having high self-esteem about motor abilities gives a chance to people for becoming a compatible individual as physical and psychological (Zeybek, 2009).

A considerable numbers of children have not reached to the advanced levels of fundamental movements due to the lack of ample opportunities for exercise and physical activities, which causes them to be weak in the specialized movements. Since this weakness has negative impacts on daily life activities, rectifying this weakness seems crucial (Gallahue and Ozmun, 1998). Improving motor skills of children at an optimum level is depending on opportunities, motivation and training. They can be provided to children by understanding motor skills as well as gender, mental and emotional dimensions (Koc, 2005). Moreover, movement training is a very important factor for improving personality features, establishing relationship with environment and reflecting emotion and thoughts (Ulutas, 2011). Acquisition of sports skills needs for long-term training period (Sayin, 2011), and development of motor learning capability is at high level between 8 and 13 ages (Mengutay, 2005). Especially, speed, aerobic endurance and quickness improves in this period (Taskiran, 1997). Therefore, movement training should be started at an early age for children. A child is an individual with his own original personality (Kilbas, 2001), and childhood is a period covering game and education (Yorukoglu, 1998). Childhood is just not a preparatory period for real life but also it is a life-section with its own specific requirements and purposes (Kilbas, 2001). Previous studies on development of children showed that causes of mental retardation can be divided into two broad categories: physical and cultural-familial (Haskins, 1986). Physical causes include genetic and chromosomal disorders and brain damage occurring prenatally (due to congenital infections, malnutrition, and

drug exposure) or postnatally (due to accident or illness). Cultural familial causes do not cause brain damage per se but occur due to life in a deprived, nonstimulating environment (American Psychiatric Association, 1987). Latest studies on psychomotor development showed that environment factors are very important for early brain development (Gokmen et al., 1995). Therefore, nowadays, emphasis on motor development has been increasing, and more time for its development has devoted to work in this area (Koc, 2005).

Basketball is one of the most important sports useful for developing skills, coordination and reaction time of the children (Sevim, 1991). It is apparent above that there are many benefits of basketball such as building up muscles of the body, building self-esteem, developing motor coordination and self-discipline, providing mental development and concentration, increasing flexibility, speed, and agility. In the light of the explanations about the benefits of basketball, the purpose of this study is to investigate the effects of basketball basic skills training on gross motor skills development of female children.

METHOD AND MATERIALS

Participants

40 healthy female children aged 11 were recruited from an elementary school in Kocaeli City of Turkey. Locomotor, manipulative and balancing trainings in Basketball Basic Skills Test for improving gross motor skills of female children lasted for 90 min a day, 2 days a week for 12 weeks. In the study period, Basketball Basic Skills Test (slalom dribbling, step slide, ball handling drills, catching and shooting, one handed basketball shot), formed by the researcher evaluating similar test used in this field (Tekin, 1987), was used in the present study. Also, observation form for the gross motor skills change, developed by the researcher, was used in the present study. Observation form for determining the gross motor skills change was coded as very poor for 1, poor for 2, average for 3, good for 4 and very good for 5. Scores of gross motor skills change were given to participants according to movement ability. Parents and school director were informed about purpose, method, place and time of the study. Consent form was taken from the parents of the children for the research.

Instrument

Stages of basketball basic skills test

1. Slalom dribbling

In this stage, each slalom was set by 5 slalom poles (1 m distance between), and participants dribble the ball through the slalom station and then back along outside the starting place. Slalom trial for each participant was made three times, and the best score was recorded by the instructor.

2. Step slide

In this stage, start and finish lines were plotted with red tapes, and

Table 1. Descriptive statistics for stage of slalom dribbling.

Slalom dribbling			Slalom dribbling				
	N	%		N	%		
Pretest	1	11	27,5	Posttest	1	3	7,5
	2	9	22,5		2	9	22,5
	3	13	32,5		3	13	32,5
	4	7	17,5		4	14	35
	5	-	-		5	1	2,5
Total		40	100	Total		40	100

Table 2. Descriptive statistics for stage of step slide.

Step slide			Step slide				
	N	%		N	%		
Pretest	1	10	25	Posttest	1	2	5
	2	11	27,5		2	7	17,5
	3	14	35		3	13	32,5
	4	5	12,5		4	13	32,5
	5	-	-		5	5	12,5
Total		40	100	Total		40	100

red tapes were set with 4 m distance. Step slide trial for each participant was made three times, and the best score was recorded by the instructor.

3. Ball handling drills

In this stage, ball handling drills for each participant was made three times, and the best score was recorded by the instructor.

4. Catching and shooting

In this stage, catching and shooting for each participant were made three times, and the best score was recorded by the instructor.

5. One handed basketball shot

In this stage, one handed basketball shot for each participant was made three times, and the best score was recorded by the instructor.

Data analysis

In this study, data with respect to observation form for the gross motor skills change were analyzed by using SPSS 18.0 Package Program. Descriptive statistics was used to determine average of the age with respect to participants. Also, paired samples t test was used to compare the scores of the participants between pretest and posttest. Level of significance was determined to be 0.05.

FINDINGS

As shown in Table 1, slalom dribbling scores were 1 (11 %27,5), 2 (9 %22,5), 3 (13 %32,5), 4 (7 %17,5) for pre-test, and 1 (3 %7,5), 2 (9 %22,5), 3 (13 %32,5), 4 (14 %35), 5(1 %2,5) for post-test.

As shown in Table 2, step slide scores were 1 (10 %25), 2 (11 %27,5), 3 (14 %35), 4 (5 %12,5) for pre-test,

and 1 (2 %5), 2 (7 %17,5), 3 (13 %32,5), 4 (13 %32,5), 5(5 %12,5) for post-test.

As shown in Table 3, ball handling drills scores were 1 (1 %2,5), 2 (11 %27,5), 3 (22 %55), 4 (6 %15) for pre-test, and 1 (1 %2,5), 2 (7 %17,5), 3 (13 %32,5), 4 (16 %40), 5(3 %7,5) for post-test.

As shown in Table 4, catching and shooting scores were 1 (5 %12,5), 2 (17 %42,5), 3 (14 %35), 4 (4 %10) for pre-test, and 1 (3 %7,5), 2 (11 %27,5), 3 (11 %27,5), 4 (12 %30), 5(3 %7,5) for post-test.

As shown in Table 5, one handed basketball shot scores were 1 (1 %2,5), 2 (13 %32,5), 3 (20 %50), 4 (6 %15) for pre-test, and 1 (1 %2,5), 2 (6 %15), 3 (13 %32,5), 4 (16 %40), 5 (4 %10) for post-test.

As shown in Table 6, there was a significant difference between pre-test score and post-test score for all parameters ($p < 0,05$).

DISCUSSION

In this study carried out to investigate the effects of basketball basic skills training on gross motor skills development of female children, forty female children took part in the study voluntarily. Results of the study showed that there was a significant difference between pre-test score and post-test scores with respect to observation form for the gross motor skills change ($p < 0.05$).

Gaggioli et al. (2013) investigated the benefits of combining mental and physical training in learning a complex motor skill in basketball. In their study, sixty female university students were randomly assigned to either mental practice with physical training, or physical training alone. As a result of their study, it was found that mental practice condition with physical training improved coordination and movement accuracy, suggesting the potential effectiveness of this approach in training complex gross motor skills. Fotrousi et al. (2012) investigated the compensatory impact of mini-basketball skills on the progress of gross motor skills in children, and hence to evaluate the degree of training impact in

Table 3. Descriptive statistics for stage of ball handling drills.

Ball handling drills			Ball handling drills				
	N	%		N	%		
Pretest	1	1	2,5	Posttest	1	1	2,5
	2	11	27,5		2	7	17,5
	3	22	55		3	13	32,5
	4	6	15		4	16	40
	5	-	-		5	3	7,5
Total		40	100	Total		40	100

Table 4. Descriptive statistics for stage of catching and shooting.

Catching and shooting			Catching and shooting				
	N	%		N	%		
Pretest	1	5	12,5	Posttest	1	3	7,5
	2	17	42,5		2	11	27,5
	3	14	35		3	11	27,5
	4	4	10		4	12	30
	5	-	-		5	3	7,5
Total		40	100	Total		40	100

Table 5. Descriptive statistics for stage of one handed basketball shot.

One handed basketball shot			One handed basketball shot				
	N	%		N	%		
Pretest	1	1	2,5	Posttest	1	1	2,5
	2	13	32,5		2	6	15
	3	20	50		3	13	32,5
	4	6	15		4	16	40
	5	-	-		5	4	10
Total		40	100	Total		40	100

Table 6. Results of the paired simple t test for all parameters.

Slalom dripling	T	5.068
	P	0.000*
Step slide	T	6.444
	P	0.000*
Ball handling drills	T	4.210
	P	0.001*
Catching and shooting	T	4.356
	P	0.001*
One handed basketball shot	T	5.339
	P	0.000*

*p<0.05.

such skills in the desired performance of sports movements. In their study, girls of 7 to 10 years old participated in Test of Gross Motor Development. The results of their study showed improvements from pre-test to post-test scores in both experimental and control groups, while the experimental group significantly performed better than the control group in the post-test. Their research results indicated that the basic mini-basketball exercises had a considerable impact on the progress of the basic movements in children, who had previously experienced delays in those movements. In the same way, several studies found a significant relationship between the percent of spent times in moderate and vigorous physical activity and total gross motor skills (Haywood and Getchell, 2009; Fisher et al., 2005).Brain et al., (2006) examined the relationship between motor proficiency and physical activity in 8 to 10 years of age children. Results of their study showed that motor proficiency was positively associated with physical

activity and inversely associated with sedentary activity in children. Kambas et al. (2012) examined the relationship between motor proficiency and pedometer-determined physical activity in 5 to 6 years of age children. The findings of their results added to the growing body of literature that considers gross motor skills as important elements of physical activity participation.

In his study, Roeber (2012) claimed that children were important given the evidence that children with motor problems were often stigmatized, with poor motor performance leading to exclusion from social activities. It was observed in his study that children had a good communication with both peers and researchers as well as an improvement in their basic basketball skills. Ulas (2014) found a difference between pretest and posttest results of development test conducted on experimental group in his study about the effects of educational games and instruction on the cognitive and gross motor development level of 10 to 12 years of age children. The reason for such a significant difference may be explained that girls can concentrate on tests well and they do not experience concentration problems. Dexterity in movement, speed and concentration can be developed by playing games (Fluri, 2005; Elzbieta et al., 2010).

In the 12-week study program, basic basketball skills were learned through games, and the materials in these games used in various activities were strong stimulant for girls. In the study carried out by Mirzeoglu et al. (2006) about the effects of computer assisted teaching on learning basketball skills, they found significant difference in experimental group in cognitive domain. In this study, though not computer assisted the fact that perception level in cognitive domain are at a desired level can be shown as another reason for success. In her study Ozcan (2005) indicated that the physical properties of the environment of sports activities are important elements in teaching motor skills. In this study, the fact that cleanliness of working environment, the materials being enough for all students and activities designed in a way to encourage children are given priority made students participate in the study and develop positive attitude towards learning. Sports acts acquired through much repetition are sports skills. Concentration and attention must be in the foreground (Sayin, 2011). In a study, it was concluded that educators are not in effective communication and interaction with children both reduced concentration and interest (Hurst, 1986). In this study, children had enough repetition for improving their gross motor skills and also they were concentrated to continue basketball basic skills program. This might have caused positive changes in gross motor skills.

Moreover, it should be recorded that there were several limitations in this study. The sample involved only female

children, this was an obvious limitation of the current study to explain generalizability of the study findings.

Further, the sample included only children 11 year of age, therefore, in future research, the basketball basic skills test applied in the study can be applied to different schools with a greater number of students to reach more trustable data with respect to motor behaviors. Also, design in this study could be manipulated to construct comparative studies divided into two groups (experiment and control/male and female).

Conclusion

The present study investigated the effects of basketball basic skills training on gross motor skills development of female children. According to data obtained in this study, basketball basic skills trainings have positive effects on gross motor skills development of female children. Basketball is one of the most popular sports in the world, and results of this study showed that it is one of the best ways to boost children's sociability and gross motor skills. The game of basketball is a complex motor multi-structured team activity based on the symbiosis of cyclic and acyclic movements of individual players with and without the ball (Trninic, 1995), the performance quality of which is directly related to motor-functional conditioning status (preparedness or fitness) of athletes and their body composition (Trninic et al., 2001). Hence, improving basketball basic skills of the children in overall education process may prepare them for a sporting lifestyle. In this context, it is suggested that similar programs can be developed by physical education and sport teachers at the elementary schools.

Conflict of Interests

The author has not declared any conflict of interest.

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