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ORIGINAL ARTICLE

An Investigation of the Basic Gymnastics Program in Preschool Children in Terms of Motor Development

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ABSTRACT

Background: Achieving an adequate level of basic motor skills by the end of the preschool period is an important prerequisite for children's participation in many later sporting activities. However, only a few studies have focused on the assessment of motor competence before starting primary school in the population of preschool children in Turkey.

Aim: The aim of this study is to present An Investigation of the Basic Gymnastics Program in Preschool Children in Terms of Motor Development

Method: Preschool children with a body weight of 18.26 ± 2.48 kg and a mean height of 1.10±.03 cm, who participated in the basic gymnastics program (n=28), participated in the study voluntarily. In our study; (n:15) experimental group students 3 days 35 minutes on 8 weekdays. gymnastics program was applied for a period of time. The control group (n=13) students were not given any activity. In order to investigate the effects of the basic gymnastics program in terms of motor development; One-leg bounce, agility, ball catching, tennis ball throwing, 9m sprint, flexibility, vertical jump, standing long jump and hitting the target performance tests were performed at the beginning and end of the study. The effects of the tests were compared between the groups in the pre- and post-test order by performing repeated measurements of variance analysis ($P < 0.05$).

Results: As a result of the analysis of the data, when the first and last measurements of the groups were compared, it was determined that the performance results of hop on one leg, agility, flexibility, vertical jump and standing long jump performance were better in the experimental group than the control group ($P < 0.05$). There was no statistically significant difference between the groups in the performance tests of catching the ball, throwing the tennis ball (9m), speed and hitting the target ($P > 0.05$).

Conclusion: For 8 weeks, the basic gymnastics program led to positive differences in one-leg bounce, agility, flexibility, vertical jump and standing long jump performance.

Keywords: Preschool Children, Motor Development, Basic Gymnastics Program, Exercise

INTRODUCTION

The preschool period, which covers the 0-6 age period, is the most intense period of human development in terms of scope, speed and quality. In the process starting from birth, it provides features that are extremely important and future-determining in terms of healthy physical, cognitive, emotional and social development. The education received between the ages of 0-6 and the effects that develop in response to these trainings and the habits to be gained form the basis for the skills to be gained in the following periods[1] Development of physical activity and sports habits of preschool children. As a result of the participation of boys and girls in regular gymnastics practice, it contributes to the development of postural control in bipedal positions, where stability and orientation skills, as well as locomotive and object control skills, become crucial in the development of the individual. [2] Children should be offered a variety of physical activities that can improve and support development as a whole. However, these physical activities should be developmentally appropriate for their age and physical activity.[3] There are many activities that can both interest preschoolers and contribute to their healthy development. [4]'Gymnastics can be considered as one of the important activities in improving children's movement skills and health through fitness. Similarly, some researchers argue that gymnastics activities are based on basic movement skills.[5] Body control fitness [6] Participation in gymnastics activities contributes to both the growth and development of skeletal mass in young children[7], which in turn improves their motor competence.[8]

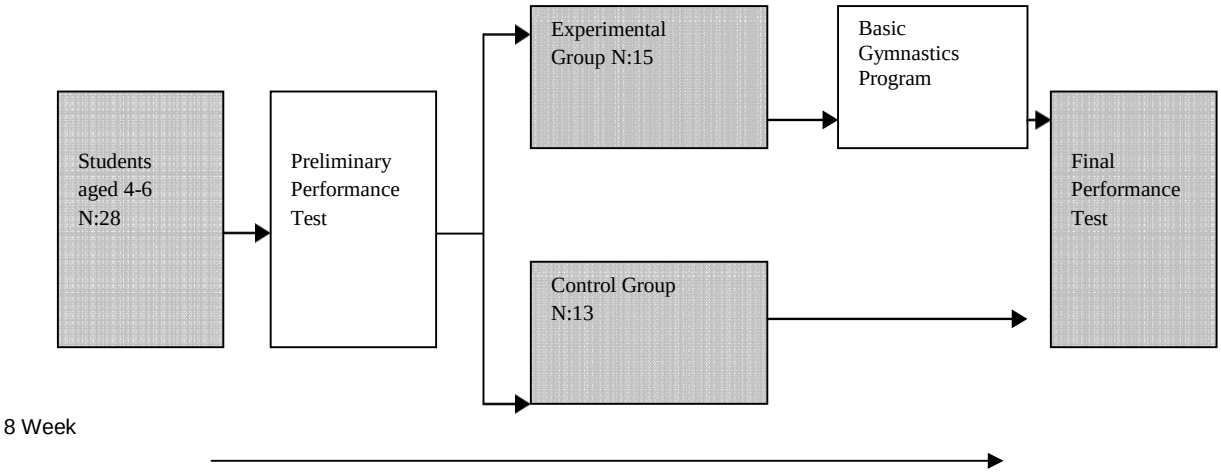
Motor development is a lifelong process of change in motor competence with possible effects on the possible interaction between the biology and social environment of individuals. [9] Since physical activity positively affects many aspects of physical and mental health[10,11] and childhood physical activity supports the development of motor skills.[12] Positive emotions towards physical education, motor skill competence, future leisure activities and sports motivation.[13] and participation in physically active play It is known to be an important factor forOkul öncesi dönemdeki çocuklarda fiziksel aktivite ve motor becerilerin artırılması birçok projenin amacı olmuştur. However, the number of high-quality randomized controlled trials in this age group is low[15] and reported data are conflicting. At the same time, little is known about the types and contexts in which physical activity can provide optimal support for the development of motor skills[16], and research is needed to understand the characteristics of effective physical activity that can develop motor skills in children. The hypothesis in this study; A child who is more physically active can develop motor skills better. However, the observed positive relationship between motor skills and gymnastics program may indicate that motor skill development can be considered an important health relationship. Accordingly, gymnastics skills are directly and indirectly integrated into the curricula of different education stages such as primary education, compulsory secondary education and baccalaureate in Spain and the education systems of

countries such as England, Germany and Canada.[17] Considering all of the above, the aim of this study was to examine the basic gymnastics program in preschool children in terms of motor development.

MATERAIL AND METHODS

Study Group: Preschool children with a body weight of 18.26 ± 2.48 kg and a mean height of 1.10±.03 cm, who participated in the basic gymnastics program (n=28), participated in the study voluntarily. In our study; (n:15) experimental group students 3 days 35 minutes on 8 weekdays. Gymnastics program was applied for a period of time. The control group (n=13) students were not given any activity. In order to investigate the effects of the basic gymnastics program in terms of motor development; One-leg bounce, agility, ball catching, tennis ball throwing, (9m) sprint, flexibility, vertical jump, standing long jump and hitting the target performance tests were performed at the beginning and end of the study. The ethical permission was obtained from Bursa Uludağ University Health Sciences Research and Publication Ethics Committee (date 06.11.2021, number: 2021 – 143).

The flow chart of the research is given in Figure 1.



Measurements: Body Composition: Participants' heights were measured barefoot using a precise height scale (Soehnle-Waagen GmbH & Co. KG). Bodyweight was measured using a bioelectrical impedance device (TANITA, TBF-300, Tokyo, Japan) barefoot while the participants had light clothing on.

Agility: The aim of the study is to measure the time between the child lying on his back, running the distance (3.05 m) by going to the vertical position, taking the tennis ball, and returning to his original state. It gives us information about the child's attention and coordination. A quickness test is applied to a model student in front of the student who is taken to the gym. Meanwhile, the student follows the model student. Then the student is given a quick test. After one trial, four applications are made. Performance time is calculated by taking the average of four applications.[18]

Ball catch: Its purpose is to measure the child's ability to catch an airborne ball. It gives information about the child's coordination. The circle with a diameter of 60 cm is mounted to the ceiling with a rope. The circle should be as close to the ground as the child's height. A catch test is applied to a model in front of the child taken to the gym. Meanwhile, the child is watching the model. Then the child is given a catch test. After two trials, ten applications are made. The ball caught with both hands is considered 3 points, the way of catching other than two hands (belly, chest, etc.) is scored 2 points, the situations where the child touches the ball even if it falls, 1 point, and 0 points if there is no effort. Performance time is calculated by taking the average of ten applications.[18]

Standing long jump: Participants stood with feet together and toes behind the jump line. Asked to take both arms backwards by bending the knees. In this position, he jumped as far as possible, pushing his legs forward and throwing his arms forward. He tried to land on both feet with the feet together and without falling backwards. The best grade of the test performed twice was recorded as the score.

Throwing a tennis ball: The aim of the study is to measure how far the child can throw the tennis ball. A starting line is drawn on the ground with a tape. The child throws the tennis ball forward from where it is. The Tennis Ball Throwing test is applied to a model student in front of the student who is taken to the gym. Meanwhile, the student is watching the model student. Then the Tennis Ball Throwing test is applied to the student. After one trial, four applications are made. Performance time is calculated by taking the average of four applications. The distance between the first point where the ball touches the ground and the starting line is measured. The best and worst performances are removed. The five best performances are averaged.[18]

(9m) Sprint Test: After the 9 m distance was drawn as a track, a wireless 2-gate Sinar (Turkey) photocell device has been fitted. The photocell started the measurement the moment the players started the sprint right after the starting photocell, and when the gate located at 9 meters was passed, the values were transferred to the computer via the Sinar software. The test was performed twice with the athletes and the best value was taken into the study.

During the measurements, the athletes were verbally motivated to give a maximal performance.

Flexibility: The flexibility of the participants was measured on the flexibility bench. Stretching distance was recorded by standing for 1-2 seconds at the farthest point on the table, by reaching forward without bending their knees, with the soles of their bare feet resting on the test bench while sitting on the floor.

Vertical Jump Test: The vertical jump test is one of the most commonly used tests to measure strength and explosiveness. The highest point where the participants could reach with their feet on the ground and the body in an upright position was considered as the starting point, and they were asked to jump to the highest point without taking a step. The difference between the starting and the highest point reached has been considered as the vertical jump value.[18] The best of three attempts was taken and recorded as “cm”. Anaerobic power was calculated according to the Lewis formula.

Jumping on one leg: To measure how many times you can bounce per square meter by jumping on one foot. They are asked to do the movement by being told to watch the model carefully. They are asked to jump to the designated area on one foot. The distance they can go is measured in meters by counting how many times they jump. As soon as the other foot touches the ground, they are asked to let go and the measurement is made from that area. [18]

Hit the target: Measure how many of the 10 balls the child can hit in the designated area. They are asked to do the movement by being told to watch the model carefully. The child is passed outside the 5 meter line and asked to throw 10 balls into the specified target in order. Balls that do not go to the target and are thrown outside the 5 meter area are considered invalid.[18]

Statistical Analysis Of Data: Within each study group 2 (experimental group and control group) ×2 (time: pre and post - test) fully repeated measures ANOVA were employed to make comparisons over the 8- weeks training sessions for the experimental group and control groups separately for pre and post measurements. When applicable, training induced changes within groups (experimental group and control group) were performed using a paired samples t test. The Effect Size Cohen’s d was calculated, which was considered small (0.20), medium (0.50), or large (0.80). Values reported are mean and standard deviation (SD). The significance level was set to $p < 0.05$

RESULTS

In this study; The basic gymnastics program in preschool children was examined in terms of motor development. The findings obtained as a result of the statistical processes explained in detail in the data analysis section of the method section; descriptive statistics and the comparison between before and after and the differences between descriptive values are presented in tables.

Table 1: The Intergroup Comparison of the Changes of the Experimental and Control Groups According to the Pre-Test and Post-Test Measurements and Descriptive Values

	8 Week Basic Gymnastics Program						
	Experimental Group (n=15)		Control Group (n=13)				
Measures	Pre (x̄ SD)	Post (x̄SD)	Pre (x̄SD)	Post (x̄SD)	F	p	η_p^2
Jumping on one leg	7.30 (1.18)	9.38 (1.50)	5.90 (1.30)	5.90 (1.64)	18.285	.000	.454
Agility	5.12 (1.10)	4.94 (.73)	6.35 (1.14)	4.64 (.97)	9.958	.005	.312
Ball catch	4.15 (1.06)	6.15 (1.90)	3.81 (.98)	3.81 (1.99)	7.086	.014	.244
Throwing a tennis ball	5.65 (1.03)	5.92 (.85)	4.96 (.81)	4.94 (1.45)	1.312	.264	.056
(9m) Sprint	4.33 (.95)	4.45 (.85)	5.13 (.82)	5.17 (.92)	.037	.849	.002
Flexibility	9.67 (2.47)	11.84 (3.43)	8.47 (1.84)	8.09 (2.50)	10.993	.003	.333
vertical jump	10.00 (2.73)	13.84 (1.36)	9.72 (3.03)	9.63 (2.83)	21.942	.000	.499
Standing long jump	116.30 (6.23)	121.92 (4.27)	110.00 (10.96)	107.72 (13.19)	11.598	.003	.345
Hitting the target	5.07 (1.18)	6.30 (1.03)	4.09 (1.44)	3.90 (1.51)	5.456	.029	.199

As can be seen in Table 1,It was determined that there was a statistically significant difference in the values of jumping on one leg, agility, flexibility, vertical jump and standing long jump in terms of the descriptive values and the comparison of the changes between the groups according to the pre-test and post-test measurements of the experimental group and the control group. ($P < 0.05$). However, it was determined that there was no statistically significant difference in the values of catching the ball, throwing the tennis ball, (9m) sprint and hitting the target in terms of the descriptive values and the comparison of the changes between the groups according to the pre-test and post-test measurements of the experimental group and the control group ($P > 0.05$). The data obtained showed that educational game activities affected the motor development of the experimental group students more positively.

DISCUSSION

A total of (n=28) children voluntarily participated in the study, who were selected by random method and were educated in kindergarten. In this study, the basic gymnastics program in preschool children was examined in terms of motor development. According to the available data in Turkey, the average time allocated to movement education in preschool childhood has decreased significantly and the lack of participation in movement

education has formed the starting point of this study. For this reason, we investigated the planned and systematic basic gymnastics program and motor development competence in the curriculum of pre-kindergarten institutions. One of the most distinctive features of preschool children is that they are active. One of the most appropriate activities to meet the movement needs of children is movement training activities. These exercises are of great importance in the development of the child's muscle coordination, endurance, strength and flexibility.[18]

As a result of this study, it was shown that the group of preschool children participating in the basic gymnastics program improved their motor skills, including hop on one leg, agility, flexibility, vertical jump and standing long jump, compared to the preschool group of children who could not participate in the basic gymnastics program. Studies have shown that; If children are encouraged to learn motor skills, their motor abilities will develop faster than expected for their age. Interfering with motor development not only accelerates motor development, but also prevents possible delays and ensures appropriate skill development.[19]

Many other research findings that support the findings of the current research.[20,21,21,22,] Also in agreement with previous research.[23] The results revealed that the gross motor skills of the children who participated in the movement training especially improved. Preschool period is a period in which the most positive and permanent contributions to movement skills can be made. This period covers the developmental stages that can guide all life. Recent studies in the field of motor development show that environmental factors on children are very important in early brain development and activities have a vital effect on children's development.[24] According to the results of the Gümüşdağ's research, it is necessary to apply more long-term applications to increase the positive effect of 12-Weeks basic game education at the levels of motor development in children aged 4 to 6 years old. [25] Therefore, descriptive information about the acquisition of individual basic movement skills and motor development and performance criteria of each skill component is required. For this, it is necessary to help plan the curriculum of the preschool institutions for the basic gymnastics program in order to develop the basic motor skills proficiency among the children of preschool age.

CONCLUSION

According to the results we obtained, when the first and last measurements of the groups were compared, it was determined that the experimental group performed better than the control group in agility, one-leg hop, agility, flexibility, vertical jump and standing long jump performance results. It is understood that the planned and long-term applied basic gymnastics program will significantly improve pre-school children's motor development.

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