INVESTIGATION OF THE EFFECT OF FOOT TRAINING USING THE AGILITY LADDER ON DRIBBLING SKILLS IN FOOTBALL

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Abstract:

The aim of this study is to investigate the effect of agility ladder using foot movements on the dribbling skill in football. 48 person aged between 8 and 15 were included in the study as a voluntary basis. A total of 4 groups were formed from the volunteers: 8-11 ages control (n=12), 8-11 ages experimental groups (n=12), 12-15 ages control (n=12) and 12-15 ages experimental groups (n=12). The training program was applied to children studying in football schools during the year. Before the normal training programs, specially planned agility ladder exercises were performed for 8 weeks, twice a week, for the athletes in the experimental group. Only normal football training program were performed to the control group. The zigzag-dribbling test was applied before and after the 8-week training program to determine the dribbling speed and skills of the volunteers. The obtained data were analyzed using the SPSS 20 package program. Paired Samples T Test was used in the analysis of the pretest-posttest data applied to the groups, since it showed normal and homogeneous distribution. One Way ANOVA test was applied to the data sets showing normal and homogeneous distribution between the groups, and Tukey HSD test was used to determine the significance in which group. As a result of the analysis of the data obtained, there was no statistically significant difference between the pre-test and post-test results of the control groups, while a statistically significant difference was found between the pre-test and post-test results of the experimental groups. When the pre- and post-test results between the groups were compared, a statistically significant difference was found between the control group and the experimental group in favor of the experimental groups. As a result, it can be said that agility ladder training contributes to the development of dribbling skills of children in the lower age group.

Keywords: training, agility ladder, football, dribbling

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1. Introduction

Football has become a major industry with its media superiority, followed by millions of people around the world with interest and enthusiasm (1). In terms of game characteristics, football is a sport in which technical and tactical skills, as well as different intensities, sudden changes of direction, basic motoric features come to the fore (2). In football, where two teams compete and face each other in a limited area, the aim is to have the ball and to get the ball into the opponent's goal (3).

As in other sports branches, one of the most important parameters in football is agility. According to many sports scientists, agility is defined as the rapid change of direction with all movements of the body or the speed of response to stimuli. In this context, the most important components of agility are; perception, decision making and changing the direction speed. Considering these components in terms of athlete performance, agility has an important place (4, 5).

Agility is deeply related to motor coordination and depends on the neurophysiological organization of movement. A ladder-like item in this context, the agility ladder is a popular tool among trainers as it is relatively inexpensive and easy to use as ground-mounted training equipment. The agility ladder can be a multi-purpose tool that can improve agility and agility when used in a variety of ways. The two most obvious goals are increased foot speed and coordination. Recent research has shown that agility ladder workouts can increase speed, agility and strength (6-8).

In this study, it is aimed to contribute to the science of sports and to the trainers who prepare a training program and provide football training in the development processes of young football players by examining the effect of footwork using the agility ladder on the dribbling skill in football.

2. Material and Method

Experimental model, one of the quantitative research methods, was used in this study. Volunteers who will participate in the study were divided into two as experimental group and control group according to age groups. An 8-week football training program was applied to the participants in our study. In addition, agility ladder training program was applied for the experimental group before the training. Before and after the training program, the participants; ın addition to height, body weight and age measurements, zigzag dribbling test measurement results were taken. Children between the ages of 8-15, who are registered to Gaziantep Altay Football School and regularly attend training, were chosen as the universe and sample group of the research. A total of 48 boys enrolled in the branches of Gaziantep Altay Football School participated in the research. The height, body weight and age variables of the sample groups participating in this study were included in our study, and these variables were shown in graphs by taking place in statistical tables. The football training program used in the study and continued for 8 weeks is given in the appendix.

2.1 Collection of Data

After the soccer dribbling pre-test was applied to 48 people of different age groups, who enrolled in Gaziantep Altay Football Schools and attended regularly, a football training program was applied for 8 weeks, 2 days a week and each training session was 90 minutes. Unlike the experimental group, foot exercises with the agility ladder were applied within a certain program before the training. Afterwards, the measurements were taken by applying the dribbling posttest to 48 children who participated in the training and continued regularly.

2.2 Statistical Analysis

Statistical analyzes of the study were performed using the SPSS statistical program (SPSS for Windows, version 20.0, 2008, SPSS Inc. Chicago, Illinois, USA). Data results were evaluated according to 95% confidence interval (p<0.05). Maximum, minimum, mean value and standard deviation scores were used for descriptive values. Kolmogorov-Smirnov and Shapiro-Wilk tests for normality distributions of data sets; Levene's Test of Homogenity was used to control the homogeneous distribution. Skewness and Kurtosis values were checked in data sets that did not show normal distribution.

Since the pre-test and post-test results between the groups showed normal and homogeneous distribution, the levels of significance between them were checked using the Paired Samples T-Test. One Way ANOVA test was used for the comparison of the groups among themselves, since the data were normally distributed, and the Tukey HSD test was applied to determine which group the significance was in.

3. Results

Table 1: Descriptive parameters of the volunteers participating in the study

Group		N	Min.	Max.	Mean	Std. Dev.	Std. Error
Control group 8-11 age	Height	12	120	145	135,00	7,62
	Weight	12	20,00	40,00	29,91	5,77
	Age	12	8,00	11,00	10,08	1,16
Control group 12-15 age	Height	12	142	181	156,00	11,34
	Weight	12	38,00	60,00	45,91	8,10
	Age	12	12,00	15,00	13,16	1,40
Experimental group 8-11 age	Height	12	124	152	137,83	7,62
	Weight	12	25,00	40,00	32,91	4,85
	Age	12	9,00	11,00	10,41	0,79
Experimental group 12-15 age	Height	12	141	179	154,00	12,40
	Weight	12	32,00	63,00	46,83	10,74
	Age	12	12,00	15,00	13,58	1,08

When Table 1 was examined, 8-11 age control group volunteers participating in the study; mean age was calculated as 10.08 ± 1.16, mean body weight 29.91 ± 5.77, and mean height 135.00 ± 7.62. Of the 12-15 year old control group volunteers participating in the study; mean age was calculated as 13.16 ± 1.40, mean body weight 45.91 ± 8.10, and mean

height 156.00 ± 11.34. 8-11 year old experimental group volunteers participating in the study; mean age was calculated as 10.41 ± 0.79, mean body weight 32.91 ± 4.85, and mean height 137.83 ± 7.62. 12-15 year old experimental group volunteers participating in the study; mean age was calculated as 13.58 ± 1.08, mean body weight 46.83 ± 10.74, mean height 154.00 ± 12.40.

Table 2: Intra-group comparison of the pre-test and post-test
results of the volunteers participating in the study (Paired Sample t-Test)

	Variable	Pre test	Post test	t	p
		Mean ± SD	Mean ± SD		
Control group 8-11 age (N=12)	Right foot dr.	14,53 ± 3,94	14,50 ± 3,94	0,573	0,578
	Left foot dr.	19,03 ± 5,48	18,95 ± 5,40	0,271	0,791
	average dr.	16,71 ± 4,60	16,72 ± 4,63	-0,162	0,874
Control group 12-15 age (N=12)	Right foot dr.	12,58 ± 1,98	12,30 ± 1,77	0,684	0,508
	Left foot dr.	14,20 ± 3,92	13,91 ± 4,08	0,960	0,358
	average dr.	13,37 ± 2,54	13,06 ± 2,77	1,097	0,296
Experimental group 8-11 age (N=12)	Right foot dr.	13,29 ± 2,31	12,20 ± 2,74	2,719	**0,020**
	Left foot dr.	14,98 ± 2,99	12,98 ± 2,29	5,506	**0,001**
	average dr.	15,09 ± 3,28	12,62 ± 2,22	2,734	**0,019**
Experimental group 12-15 age (N=12)	Right foot dr.	11,73 ± 1,20	11,07 ± 1,27	2,610	**0,024**
	Left foot dr.	13,33 ± 1,34	11,80 ± 1,31	6,096	**0,001**
	average dr.	12,50 ± 1,04	11,43 ± 1,11	5,209	**0,001**

Note: dr. = dribbling

When Table 2 was examined, no statistically significant difference was found between the pre-test and post-test results of the control groups (p<0.05). On the other hand, a statistically significant difference was found between the pretest and posttest results in favor of the posttest in the experimental groups (p<0.05). Related graphics of the table are given.

Table 3: Comparison of the left foot, right foot and mean dribbling
pre-test results of the volunteers participating in the study (One way Anova)

Vaiable	Grup No.	n	p	Groups with Significant Difference
Right foot dribbling	1. 8-11 age control	12	0,066	-
	2. 12-15 age control	12		
	3. 8-11 age exp.	12		
	4. 12-15 age exp.	12		
Left foot dribbling	1. 8-11 age control	12	**0.003**	1-2, 1-4
	2. 12-15 age control	12		
	3. 8-11 age exp.	12		
	4. 12-15 age exp.	12		
Average dribbling	1. 8-11 age control	12	**0.011**	1-4
	2. 12-15 age control	12		
	3. 8-11 age exp.	12		
	4. 12-15 age exp.	12		

When Table 3 was examined, no statistically significant difference was found between the groups in the pre-test results in right foot dribbling (p<0.05). On the other hand, there was a statistically significant difference in left foot dribbling between 8-11 age control group, 12-15 age control group and 12-15 age experimental groups in favor of 12-15 age groups (p<0.05). However, a statistically significant difference was found between the 8-11 age control group and the 12-15 age experimental group in favor of the 12-15 age experimental group in average dribbling (p<0.05).

Table 4: Comparison of the left foot, right foot and average dribbling
post-test results of the volunteers participating in the study (One way Anova)

Variable	Grup No	n	p	Groups with Significant Difference
Left foot dribbling	1. 8-11 age control	12		
	2. 12-15 age control	12		
	3. 8-11 age exp.	12	**0,022**	1-4
	4. 12-15 age exp.	12		
Right foot dribbling	5. 8-11 age control	12		
	6. 12-15 age control	12		
	7. 8-11 age exp.	12	**0,001**	1-2, 1-3, 1-4
	8. 12-15 age exp.	12		
Average dribbling	9. 8-11 age control	12		
	10. 12-15 age control	12		
	11. 8-11 age exp.	12	**0,001**	1-2,1-3, 1-4
	12. 12-15 age exp.	12		

When Table 4 is examined, a statistically significant difference was found between the 8-11 age group and 12-15 age experimental groups in favor of the 12-15 age experimental group in the post-test results in right foot dribbling, however, no statistically significant difference was found between the other groups. (p<0.05). A statistically significant difference was found between the 8-11 age control group and the other groups in favor of the other groups in the left foot dribbling and mean dribbling post-test results (p<0.05).

4. Discussion

In this part of the study, the findings were compared and discussed with similar studies in the literature. Being successful in football depends on teaching basic football knowledge and techniques at a young age by giving the necessary importance to infrastructure studies. It is very important to follow the developmental characteristics of the athletes, who are trained in the infrastructure of football teams, to reach the elite levels, to pass many skill tests and to determine the working methods according to them (9). Therefore, studies are carried out to develop methods, techniques and tests that can perfect many skills that should be acquired at an early age, and it is desired to reach more advanced levels by following these developments closely.

In our study, when the pre-test and post-test results of the control and experimental groups were compared; While there was no statistically significant difference between the pre-test and post-test results of the control groups, a statistically significant difference was found between the pre-test and post-test results in both experimental groups. It was observed that the right foot dribbling, left foot dribbling and average dribbling times of the experimental groups both in the 8-11 and 12-15 age groups improved significantly compared to the pre-test.

In the intergroup comparison of the pre-test results of the control and experimental groups, no difference was found between the groups in right foot dribbling. On the other hand, a significant difference was found between the 8-11 age control group and the 12-15 age control and experimental groups in left foot dribbling in favor of the 12-15 age control and experimental groups. In average dribbling, only a significant difference was found between the 8-11 age control group and the 12-15 age experimental group in favor of the 12-15 age experimental group.

In the comparison of the post-test results of the control and experimental groups, there was a statistically significant difference in right foot dribbling only between the 8-11 age control group and the 12-15 age experimental group in favor of the 12-15 age experimental group, but no statistical significance was found in the other groups. In the left foot dribbling post-test results, there was a statistically significant difference between the 8-11 age control group and 12-15 age control group, 8-11 age experimental group and 12-15 age control groups. not found. Similarly, in the mean dribbling post-test results, there was a statistically significant difference between the 8-11 age control group and the 12-15 age control group, the 8-11 age experimental group and the 12-15 age control group, and there was no statistically significant difference in the other groups. no difference was found.

Robin and Louis (2019), in their study examining the effect of ladder training on the agility level of football players in the background, reported that there was a statistically significant improvement in favor of the posttests of the experimental group in which they had ladder training, among the pretest and posttest agility test results they applied to the volunteers (10).

Murugavel and Giridhara (2020), in their study in which they examined the effect of 12-week ladder training on various skills of football players, reported that ladder training positively affected the dribbling skills of football players (11).

Malathy (2019), in his study named the effect of ladder training on agility and explosiveness, stated that a significant improvement was achieved in the speed and explosiveness variables of the experimental group, but; reported that there was no improvement in all variables of the control group (12).

Alviana et al. (2019), in their study named the effect of agility ladder on speed and agility, concluded that ladder exercise has a significant effect on speed and agility (13). Pandarwidi S, Siantoro and Hamid (2020), in their study named the effects of zigzag ladder exercises on speed and agility, reached a similar conclusion with the previous

study. They reported that Zigzag Ladder exercises had a significant effect on speed and agility (14).

Novan Ulfiansyah et al. (2018), in their study named the effect of agility exercise and eye-foot coordination on dribbling ability, reported that these two types of exercises are equally good at improving dribbling ability (15).

In their study named Padron Cabo et al. (2020), the effects of training with agility ladder on sprint, agility, dribbling performance in young football players, it was concluded that 6-week agility ladder training was insufficient to improve these characteristics of football players and this application period should be a more reasonable process (16).

Dinata, Umar, and Argantos (2019) reported that a high level of statistically significant difference was found between agility and dribbling skills in their study examining the effects of agility, speed and self-confidence on dribbling skills in football (17).

Ramadani et al. (2017) reported that eye-foot coordination and agility contribute significantly to the development of dribbling skills in their study examining the effects of eye-foot coordination and agility on dribbling skills in young football players (18).

Daulay and Azmi (2021), examining the relationship between coordination and agility and dribbling skills in football, researchers reported that coordination and agility exercises have important contributions to improving dribbling skills in their study (19).

Neviantoko et al. (2020), in their study examining the effect of agility ladder on speed, reported that agility ladder studies affect speed positively. Considering the direct relationship between speed and dribbling, it can be thought that this situation may also positively affect dribbling speed (20).

Agility ladder training is a work based on the principle that a movement is applied in a certain direction with various combinations and the movement is completed in the shortest possible time. From this point of view, it is thought that the agility ladder studies can contribute positively to both speed, coordination and agility (20).

As a result, it can be said that the agility ladder studies to be applied in football training can positively affect the dribbling skills of the lower age group football players.

Conflict of interest statement
There are no potential conflicts of interest on this article.

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