

The Effects of Additional 8-Week Quickness Exercise Applied to Trained Wrestlers in the Category of Cadet, Young and Adults on Agility and Reaction Times

Cagri Celenk¹, Mehmet Ozal², Ersan Kara³, Taner Yilmaz³, Mustafa Akil³ and Bilal Demirhan⁴

¹Erciyes University, School of Physical Education and Sports, Kayseri, Turkey

²General Directorate of Sports, Ankara, Turkey

³Usak University, Faculty of Sport Sciences, Usak, Turkey

⁴19 Mayıs University, Yasar Dogu Sport Sciences Faculty, Samsun, Turkey

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ABSTRACT This study was carried out to examine the effects of an additional 8-week quickness exercise applied to trained wrestlers in the category of cadet, young and adults, on their agility and reaction times. When the data results were analyzed, it was observed that there was a significant difference between the agility test results of cadet and young athlete subjects ($p < 0.05$). However, t-test results showed that there was no significant difference between light and audio reaction parameters ($p > 0.05$). In conclusion, the results of this study showed that the 8-week quickness exercise applied to trained wrestlers had a positive effect on the agility performance of cadet and young athletes. There was no effect in the category of adult athletes who wrestle in the category of adults in terms of their agility and reaction times.

INTRODUCTION

In many sports branches, tactical and technical abilities are required with accuracy in order to cope with the pressure from competitors. Moreover, the athletes need a high level of performance. Therefore, exercises engaged must be compatible with the activities performed during the competition as much as possible (Bangsbo et al. 2006). Physical adaptation means performing the right activities according to the capability of the body. The aim of physical adaptation is to achieve a high level of performance while minimizing the associated health risks (Zorba 1996). The main aim of trainers in all sport branches is to achieve high levels of performance. Thus, making use of scientific principles is of utmost importance in achieving high performance levels. Increase in the amount of information related to several muscle developing trainings provides trainers with new chances to better develop athletes (Kizilet et al. 2010). Studies on detecting sports ability showed that the ability is entirely based on some factors (Montes-Mico

et al. 2000). Physical adaptation means performing the activities accurately depending on the capability of the body (Zorba 1996). It is common knowledge that agility and change-of-direction-speed are used interchangeably in sport literature. Therefore, a significant proportion of real sport agility depends on quick and accurate responses to stimuli specific to sport environments (Spasic et al. 2015). The agility that is accepted among the mentioned factors is stated as acceleration, deceleration and changing direction frequently and also described as starting and stopping in a quick manner (Young et al. 2001). In many branches of sports activities that comprise sudden changes, quickness and agility are of utmost importance (Miller et al. 2006). However, wrestling is not only a fight but is a sport branch requiring sportive performance and control such as a high level of strength, flexibility, speed, agility, balance and reaction (Yoon 2002). Developing agility increases sportive performance and helps athletes control the physical positions of their bodies for the most suitable body positioning during performance, and provide athletes with a great control ability to move faster (Sole et al. 2013). The quickness is how the player keeps his/her speed under control, thus the athletes can change direction with less loss and in a balanced manner. Previous studies on the subjects showed that long trainings have a significant effect on quickness and agility (Moreno 1995; Twist and Benicky 1996). An-

Address for correspondence:

Taner Yilmaz

Usak University, Faculty of Sport Sciences,
Usak, Turkey, 64000

Telephone: +905327765765

Fax: 0276 221 22 22

E-mail: taner.yilmaz@usak.edu.tr

other effect of long trainings is improvement of reaction during performance, and reaction is accepted as a vital performance standard. Time factor also plays an important role in sportive performance. Several studies have been conducted on the reaction time and several dimensions of movement speed. The sport researchers were mainly interested in the methods of developing speed and reaction time and how the said methods affect physical performance (Karadag and Kutlu 2010).

The aim of this study was to examine the effects of an additional 8-week speed exercise applied to trained wrestlers in the category of cadet, young and adult athletes on agility and reaction times.

METHODOLOGY

Subjects

The population group of the study consists of the subjects who wrestle at the Adalet Sports Club in Ankara, while the sample group comprises the volunteers, chosen with random sampling method, who wrestle actively and are included in the category of cadets ((n=8) Age: 16.12±0.22, Height: 172.43±2.09, Weight: 73.14±4.17), young athletes ((n=10) Age: 18.60±0.26, Height: 174.20±2.91, Weight: 75.82±5.59) and adults athletes ((n=8) Age: 23.37±1.19, Height: 173.41±1.82, Weight: 74.63±3.53). Speed exercises were applied during the final 8 weeks before the competition for 8 to 10 minutes and three times a week in addition to wrestling trainings. In order to examine the effect of the 8-week exercise on agility, the athletes were subjected to the Illinois agility test and t-test and the Newtest 2000 reaction tool was used in order to measure the visual and audio reaction times. The study was performed during the competition period after the athletes were informed. The measurements were taken twice, before and after the program. Plyometric exercises, jumping drills, and direction changing exercises, drills with sudden turns and other agility-developing exercises were performed by taking the explosiveness into consideration in the agility trainings. The plyometric exercises were applied before starting the trainings after adequate warm-up exercises.

T-test

This test was applied in order to determine the speed of athletes, at which they cover a dis-

tance by changing direction during a sprint, right-left sliding and back running. Three funnels were positioned at the same level with a distance of 4.57 meters interval. Funnel A was positioned 9.14 meters away from the funnel B in the middle. Firstly, the subjects were asked to touch the funnel at point B with their right hands by starting from point A. Then, they were asked to move towards funnel C from funnel B by means of sliding steps, and to touch funnel C with their left hands. The test was completed after the subjects moved to funnel D from funnel C by means of side sliding steps and have touched thereof with their right hands and then, they have run to funnel B and touch with their left hands and after all these, they have to run back to point A. The test completion times of the subjects were measured with a chronometer. Each of the subjects performed the test twice and the best time was recorded in terms of seconds in accordance with the grade of the subject (Sporis et al. 2010; Okudur and Sanioglu 2012).

Illinois Agility Test

A test racing track consisting of three cones with a width of 5 meters, height of 10 meters and gaps of 3.3 meters at the center, which were ordered on a straight line was used. The test consisted of 40 meters straight running and 20 meters slalom running among the cones with returns of 180 degree for every 10 meters. After the test racing track was prepared, an electronic chronometer system with two doors and photo emissive cell, which measures with a sensitiveness of 0.01 seconds, was positioned at the start and end of the racing track. Before the test, the subjects were informed of the racing track, and were allowed to perform 3-4 trials at low pacing. Then, the subjects were allowed to perform 5-6 minutes of warm-up exercises and stretching exercises at a low pacing determined by the subjects. The subjects left the racing track through the starting point in such a manner that they were reclining face down and keeping their hands at shoulder length and in contact with the ground. The finishing times were recorded in seconds. After a complete rest period, the test was performed two times and the best grade was recorded (Karacabey 2013).

Reaction Time

The reaction tests were performed using the Newtest 2000 tool and simple audio and light

reaction times were measured with a sensitiveness of 1/1000. Each of the subjects were informed of the reaction time measurements for 5 minutes before the measurement and the effects of learning factors were standardized. The measurements were performed in an environment with adequate light and audio. In the visual selecting reaction time measurement, the volunteers were asked to be seated at a table in a comfortable manner with their hands on the table opposite the person who is performing the test, and the index finger of the right hand was positioned at the right button and the index finger of the left hand was positioned at the left button, and when the light was switched on, the subject was demanded to push the right button and to push the left button when the left light was on. Then, the subject was demanded to switch off the light in a shorter time. The minimum and maximum values of the measurements were recorded and the arithmetic averages were calculated, and the results of the measurements were recorded in milliseconds (Cinar 2009; Tamer 2000).

Statistical Analysis

The SPSS 15.0 statistical package program was used to evaluate the data. The data was summarized by calculating the mean and standard deviation. A paired samples t-test was used for comparing the in-group pre-test and post-tests. Error performance was determined as 0.05 in the study.

RESULTS

When the collected data was analyzed, the t-test results showed that there is no significant difference in the reaction times of wrestlers between the category of stars and the young ($p=0.03$, $p=0.02$, $p<0.05$). A decrease was observed in the agility values of the wrestlers in the category of stars and young after the exercise. However, there was no significant difference (Table 1).

Table 1: The reaction and agility test results of wrestlers in the categories of stars, young and adults

Variables	Categories		X±SD	t	p
Visual Light Reaction Time (Left, msn)	Stars (n=8)	Pre test	213.25± 14.22	.566	0.58
		Post test	209.37± 22.87		
	Young (n=10)	Pre test	196.10± 15.06	0.191	0.85
		Post test	195.30± 24.75		
	Adults (n=8)	Pre test	186.12± 17.97	1.505	0.17
		Post test	180.62± 9.98		
Visual Light Reaction Time (Right, msn)	Stars (n=8)	Pre test	227.37± 33.38	2.15	0.06
		Post test	196.62± 18.53		
	Young (n=10)	Pre test	204.10± 30.75	0.953	0.36
		Post test	195.70± 25.86		
	Adults (n=8)	Pre test	188.12± 26.05	0.222	0.83
		Post test	185.75± 19.95		
Audio Reaction Time: (Left, msn)	Stars (n=8)	Pre test	193.87± 20.03	1.06	0.32
		Post test	181.50± 21.21		
	Young (n=10)	Pre test	175.80± 31.72	-.108	0.91
		Post test	177.00± 18.56		
	Adults (n=8)	Pre test	163.12± 10.32	0.026	0.98
		Post test	163.00± 16.23		
Audio Reaction Time: (Right, msn)	Stars (n=8)	Pre test	192.25± 21.92	0.459	0.66
		Post test	184.50± 30.40		
	Young (n=10)	Pre test	183.90± 34.75	0.446	0.66
		Post test	178.40± 27.33		
	Adults (n=8)	Pre test	163.75± 16.23	-.177	0.86
		Post test	164.87± 23.75		
T test	Stars (n=8)	Pre test	11.68± 0.41	0.133	0.89
		Post test	11.66± 0.50		
	Young (n=10)	Pre test	11.38± 0.52	-.225	0.82
		Post test	11.44± 0.67		
	Adults (n=8)	Pre test	11.65± 0.57	1.25	0.25
		Post test	11.52± 0.59		
Illinois Agility Test	Stars (n=8)	Pre test	17.82± 0.68	2.529	0.03*
		Post test	17.18± 0.37		
	Young (n=10)	Pre test	16.91± 0.88	2.800	0.02*
		Post test	16.62± 0.78		
	Adults (n=8)	Pre test	16.67± 0.86	-.081	0.93
		Post test	16.69± 0.77		

DISCUSSION

The reaction time is one of the most vital elements in the effectiveness of speed and decision-making mechanism in the performance and also, it is accepted as the most common method for measuring the physical speed changes (Turen et al. 2013; Salthouse 2000). The success levels of the athletes having equal conditional and technical capacity and abilities, but having short reaction times can be improved. The reaction time is the distinctive factor in many sports branches and can be improved with regular exercises (Sacuzzo and Michael 1984; Imamoglu and Kilcigil 2007). This study revealed that there was no difference between reaction times before and after the exercises in an additional 8-week quickness exercise applied to active wrestlers in the category of cadet, young and adult athletes (Table 1). The studies on reaction times provided data showing that exercise does not have any effect on reaction time (Lemmink and Visscher 2005; Lord et al. 2006). However, there are more common studies showing that exercise has a positive effect on reaction time (Ando et al. 2004; Lidor et al. 1998; Kokubu et al. 2006; Montes-Mico et al. 2000). When the results of the study were studied, the time differences in the reaction times of cadet, young and adults were clearly observed and (Table 1) it is believed that the reason is the exercise and the age. However, the effect of quickness exercise performed in addition to standard wrestling exercises, on the reaction time was not determined. The reason no significant difference was observed in the reaction time is that the athletes were trained before the first measurement and the reaction times improved. When the effect of quickness exercises on the agility in this study was considered, there was no significant difference in the t-test results. However, there was an improvement in agility test data in the category of cadet and young athletes ($p=0.03$, $p=0.02$, $p<0.05$). Some improvements may arise from plyometric trainings (Kizilet et al. 2010). The agility is a vital characteristic in sports performance and a well-founded base may be formed for the control of the neuromotor system and motor skills by improving the agility. Changing directions is a common reason of injuries in sports branches. Therefore, the risk of injuries may be minimized by improving the suit-

able individual movement mechanics (Little et al. 2005; Sheppard and Young 2006).

CONCLUSION

This study concluded that the additional 8-week quickness exercise applied to trained wrestlers had a positive effect on the agility performance in cadet and young athletes. However, it does not have any effect on the athletes who wrestle in the category of adults in terms of agility and reaction times.

RECOMMENDATIONS

The agility performances may be improved with additional 8-10 minutes of quickness exercises that will be added to the training programs of juniors and young athletes by the wrestling trainers.

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