Educational Administration: Theory and Practice
2024, 30(5), 3708-3712
ISSN: 2148-2403
https://kuey.net/
Research Article

The Effect Of 8 Weeks Of Visual Reaction Trainings On Recognition Time In Badminton Athletes Between 10-12 Years Of Age

Tuba Kızılet[1]*, Enis Sesalan[2], Nurettin Ersin Uzun[3], Ayşenur Kurt Türkoğlu[4], Hakan Hüseyin Kudak[5]

[1] Assistant Professor, Marmara University Faculty of Sports Sciences, Istanbul, Turkiye
[2] Physical Education Teacher,
[3] Research Assistant, Rumeli University Faculty of Sports Sciences, Istanbul, Turkiye
[4]Doctor, Rumeli University Faculty of Sports Sciences, Istanbul, Turkiye
[5]Zonguldak Bülent Ecevit University Faculty of Sports Sciences, Istanbul, Turkiye

***Corresponding Author:** Dr. Tuba Kızılet
*E-mail: tuba.kizilet@marmara.edu.tr

Citation: Dr. Tuba Kızılet et.al (2024), The Effect Of 8 Weeks Of Visual Reaction Trainings On Recognition Time In Badminton Athletes Between 10-12 Years Of Age.., Educational Administration: Theory And Practice, 30(5), 3708-3712
Doi10.53555/kuey.v30i5.3521

ARTICLE INFO **ABSTRACT**

Badminton is a sport that technical features are at the forefront. For an effective performance, it is necessary to have very good technical capacity. Another factor that affects success in badminton is the ability to anticipate and make decisions. In order to be successful in sports, perceptual competencies are needed as well as physical competencies. In this context, the aim of this study is to examine the effect of 8-week visual reaction training on detection time in 10-12 year old badminton players. The research population consists of a total of 20 badminton athletes, 10 boys and 10 girls, who are of school age between the ages of 10-12. A weekly visual reaction training was applied to the athletes and a preliminary test was performed with the Bassin anticipation timer device (Lafayette Instrument Company, model 35575) before and after the training. As a result, according to the results of the Same sample t-test, there was a statistically significant difference between the pre-test and post-test in the research group. While there was a difference (r=001; p<0.05), no difference was seen in the Control group (r=.056; p<0.05). According to these results, it can be said that visual reaction training in addition to classical training contributes to the development of perception performance.

Keywords; Badminton, Anticipation, Reaction

Introduction

Badminton is a sport where technical features are at the forefront. It is one of the fastest racket sports in the world; the speed of badminton smashes can be as high as 30 m/s[1]. Also badminton player must react to the moving shuttlecock and adjust their body position rapidly and continuously throughout the game[2]. In addition, it is necessary to have a very good technical capacity for an effective performance. As it is known, the technique is the realization of nerve-muscle coordination for the desired purpose. Good coordination occurs through cooperation with other motoric features[3,4].

Badminton is a sport played by one or two people mutually. Badminton is one of the rare sports that enables quick decision making and puts the tactical decision mechanism of the human brain in the best positive shape within seconds[5]. Badminton is an Olympic sport based on mind, quickness, mobility, reaction and aesthetics[6]. The common idea in the definition of badminton is that basic motor skills are an important element. In this regard, coaches and academics should decide which motoric feature or skill the athletes need and support their performance development by guiding them accordingly[7]. Another factor that affects success in badminton is the ability to anticipate and make decisions. In order to be successful in sports, perceptual competencies are needed as well as physical competencies. In all sports, high-level perceptual abilities are needed to perform skills effectively and efficiently. Sensing time is one of these perceptual abilities[8].

Detection time is generally used to test hand-eye coordination and estimate its visual accuracy[9]. The fact that the flight distance of the badminton ball is different and surprising suggests that reaction time may be more important in badminton sports. Therefore, badminton athletes need to have good balance, short reaction time and speed throughout the competition[10]. Badminton is at the forefront of sports branches in which balls are played fast. The investigations have shown that the badminton players have an average time of 0.13-0.30 seconds to block the opponent's movement while in the defensive position. Especially when the ball speed is considered, the badminton depends on the quick reactions in order for the player to hold in the game. In line with these definitions, the importance of visual activities in badminton can be understood. Physiological and physical tests are important in detecting these. In this context, the aim of this study is to examine the effect of 8-week visual reaction training on detection time in 10-12 year old badminton players.

Materials And Methods

Research Population and Sample

The research population consists of a total of 20 badminton athletes, 10 boys and 10 girls, who are of school age between the ages of 10-12. The research was conducted in 2018 at Gaziosmanpaşa Plevne High School with Gaziosmanpaşa Municipality Sports Club athletes. Age, height and weight measurements of the participants in the study were taken. Participants with physical disabilities or those that would prevent them from performing the test were not included in the study. In this study, a research and control group of 10 people (5 boys and 5 girls) were established.

Data Collection Materials

Reaction Test

The measurement was made in the gym with the Bassin anticipation timer device (Lafayette Instrument Company, model 35575), and the device was placed on the table and introduced to the athletes. While the subject was sitting on a chair 2.5 m away from the device, he was asked to press an electronic button that he could grasp with his hand and stop the target whenever he wanted, at the moment when the moving light on the detection time device was at the targeted termination point (13th of the 2nd device). The result of pressing the button was noted. While collecting the results, the athletes were asked to use the (dominant) hand they use while playing badminton and measurements were made in this way. Before the measurement, the athletes were given 3 trials and feedback was given about their performance. The device has adjustable features for different speeds, and the data were measured at a speed of 7 m/sec and 5 times (Shea and Ashby, 1981).

Training Program

After the pre-test applied to the athletes, the research group implemented an 8-week branch-specific visual reaction program 2 days a week. At the end of 8 weeks, the same test was performed again and final measurements were made.

8 WEEKS VISUAL REACTION TRAINING			
DAY	**WEEK**	**REPETITION**	**TRAINING TYPE**
Fri.	1	1-)5x4	1-) Visually stimulated speed training.
Sun.		1-)8x4 2-)8x4x2	1-) To catch the ball by throwing one of the balls in both hands. 2-) Visually guided badminton-specific stepping
Fri.	2	1-)8x4 2-)12x4	1-) Catching the tennis ball dropped from above 2-) Making movements with cue cards
Sun.		1-)30 seconds 5 sets 2-)5x3	1-) Throwing and controlling 2 tennis balls in the air 2-) There is a yellow and red plate behind me. If I lift red, run.
Fri.	3	1-)10x4x2 2-)20sn 6 sets	1-) Visually guided badminton-specific stepping 2-) Being a 2-man and following the opponent's movements
Sun.		1-)5x4	1-) Visually stimulated speed training
Fri.	4	1-)8x4 2-)10x5	1-) To catch the ball by throwing one of the balls in both hands. 2-) Throwing a ball to the wall behind the athlete who is facing the wall and making him catch it.
Sun.		1-)30 seconds 5 sets 2-)15x4	1-) Throwing and controlling 2 tennis balls in the air 2-) Making movements with cue cards
Fri.	5	1-)10x4 2-)5x3	1-) Catching the tennis ball dropped from above 2-) There is a yellow and red plate behind me. If I lift red, run.
Sun.		1-)8x5 2-)10x5x2	1-) To catch the ball by throwing one of the balls in both hands. 2-) Visually guided badminton-specific stepping
Fri.	6	1-)20 seconds 6 sets 2-)12x5	1-) Be in pairs of 2 and follow the opponent's movements 2-) Throwing a ball to the wall behind the athlete who is facing the wall and making him catch it.
Sun.		1-)8x5 2-)15x5	1-) To catch the ball by throwing one of the balls in both hands. 2-)Making movements with cue cards
Fri.	7	1-)10x5 2-)6x4	1-) Catching a ball dropped from above 2-) Visually stimulated speed training

Sun.		1-)12x5 2-)10x5x2	1-) Throwing a ball to the wall behind the athlete who is facing the wall and making him catch it. 2-) Visually guided badminton-specific stepping
Fri.	8	1-)30 seconds 6 sets 2-)5x3	1-) Throwing and controlling 2 tennis balls in the air 2-) There is a yellow and red plate behind me. If I lift red, run.
Sun.		1-)10x6 2-)6x3	1-) Catching the tennis ball dropped from above 2-) There is a yellow and red plate behind me. If I lift red, run.

Statistical Analysis

Descriptive statistics (mean and standard deviation) were used to evaluate all physical and biomotor characteristics. To determine the normality distribution, the Kolmogrov-Smirnov test was applied, taking into account the kurtosis-skewness values. It was determined that the values were in accordance with normal distribution and parametric statistical tests were performed. Independent sample t-test was used to detect differences between groups and paired t-test was used to statistically analyze the pre-post test differences between groups. The statistical significance level was determined as $p<0.05$.

Findings

In this study, the results of the reaction tests applied to 20 badminton athletes between the ages of 10-12 after 8 weeks of visual reaction training are as follows.

Anthropometric Characteristics of Athletes

Table 1. Means, standard deviation values and independent sample t-test values of the differences in physical fitness and anthropometric characteristics of the research and control groups in terms of gender

		Average	Standart D.	P
Age	**Boy**	11,1	,31	0,52
	Girl	11,2	,63	
Height (cm)	**Boy**	149,8	5,20	0,70
	Girl	152,2	9,01	
Weight(kg)	**Boy**	39,8	5,78	,292
	Girl	39,5	6,94	

When the anthropometric characteristics of the athletes in terms of gender are evaluated, there is no statistical difference between male and female athletes when the independent sample t-test results are examined statistically ($p <0.05$).

Table 2. Averages, standard deviation values, change percentages and independent sample t-test values of the differences in physical fitness and anthropometric characteristics of the research and control groups

		Avg.	Standard V.	P
Age	**Research**	11	.47	,151
	Control	11.3	.48	
Height (cm)	**Research**	150	8,11	.859
	Control	152	6,59	
Weight (kg)	**Research**	37,7	4,86	,412
	Control	41,67	7,02	

When the anthropometric characteristics of the athletes are evaluated in terms of groups, there is no statistical difference between the research and control groups when the independent sample t-test results are examined statistically ($p>0.05$).

Table 3. Averages, standard deviation values, change percentages and paired sample t-test values of the reaction time differences of the research and control groups

		x±Ss	%	P
Research Group	**Pre Test**	63.14 ± 20.05		**.001**
	Post Test	35.71± 10.66		
Control Group	**Pre Test**	57.95± 18.47		.056
	Post Test	46.61± 19.91		

When the pre-test and post-test values of the groups are compared, according to the Same Sample t-test results, there is a statistically significant difference between the pre-test and post-test in the research group (r = 001; $p < 0.05$), while there is no difference in the Control group (r = .056). ;$p<0.05$).

Table 4. Averages, standard deviation values, change percentages and independent sample t-test values of the reaction time differences of the research and control groups

		x±Ss	%	P
Pre Test	**Research**	63.14 ± 20.05		.555
	Control	57.95± 18.47		
Post Test	**Research**	35.71± 10.66		.091
	Control	48.56± 20.15		

When the pretest and posttest values of the groups are compared within the groups, according to the independent sample t-test results, there is no statistically significant difference between the pretest and posttest ($p=.555$; p.091) ($p<0.05$).

Discussion and Conclusion

To be a successful athlete, reaction time is one of the most determining factors of sports performance[11]. Neurophysical approaches to visual-motor assessments and development of content for visual training can improve the skills of athletes. Reaction time training is especially important for sports that require visual-motor development[12]. A faster visual reaction time will benefit athletes by allowing them to react faster to the demands of their sport[13].

This shorter reaction time in badminton players is due to regular training, the effects of which have been stated to provide better muscle coordination, improved concentration and alertness to external factors in their bodies[14]. Eye-hand coordination is similar between badminton players and controls[2]. This finding has been demonstrated in studies showing that badminton players have superior eye-hand reaction time, visual-spatial processing, and eye-hand coordination, than non-badminton players. (eye–hand coordination was similar between the badminton players and controls. This finding was in contrast to our postulation and previous demonstrating that badminton players studies had superior eye–hand reaction time[14], visuospatial processing, and eye–hand coordination[15] relative to those who do not play badminton.

Decision making and sensing are one of the most important factors in sports performance. This is especially important in one of the fastest sports in the world, such as badminton. When the detection times of tennis, table tennis and badminton athletes were examined, it was determined that tennis players had a shorter time at low stimulus, badminton players at medium stimulus, and table tennis players at high stimulus than other branches[8].

Comparing the detection times of students doing team sports and individual sports, the average detection time of athletes doing individual sports (Badminton-Table Tennis) is 0.047 seconds. While the average detection time of athletes playing team sports (Basketball-Handball) is 0.054 seconds. Has been found. In this study, it was found that athletes doing individual sports had better detection times than athletes doing team sports ($p=0.01$)[16].

In the study where the effect of exercise intensity and stimulation speed on the detection time was examined in young badminton players depending on gender, three different running protocols were applied (rested, 70% and 90% Heart Rate) and as a result of the detection (1 mph and 5 mph) measurements made from these, three exercise intensity situations and It was found that boys had better performance than girls during the low perception period. It has been shown that measurements where the stimulation rate is high have a better and more consistent detection time [17].

In the research conducted to determine the effect of visual reaction training on the visual-motor reaction time of badminton players, it was concluded that visual reaction training is effective in improving the visual perception skills of badminton players[12]. Another study applied to badminton athletes showed that there was an improvement in reaction times as a result of 8-week visual reaction studies[18]. In another study, some visual function (included Visual reaction time, Tracking and Visual concentration) showed better results in the research group[19].

In the presented study, the effect of visual reaction training on detection time in badminton players between the ages of 10-12 was examined. According to the statistical results, when comparing between groups, there is a significant difference ($r = 001$; $p < 0.05$), while there is no difference in the control group ($r = .056$; $p < 0.05$). Although the study results are similar to the literature results, it can be said that visual reaction training in addition to classical training contributes to the development of perception performance.

Suggestions

Especially in badminton, 10-12 years of age is the age range that is most common to start playing sports. Beginning badminton athletes have difficulty in combining the shuttlecock with the ball and hitting the ball. The biggest problems of these can be shown as hand-eye coordination and deciding and anticipating when to strike. With the results of this study, visual reaction training can improve perception performance, making it easier to teach these skills in badminton. For this purpose, more clear information can be obtained by comparing athletes in a wider age range and with sports background in different years.

References

1. Wong, T. K., Ma, A. W., Liu, K. P., Chung, L. M., Bae, Y. H., Fong, S. S., ... & Wang, H. K. Balance Control, Agility, Eye–Hand Coordination, and Sport Performance of Amateur Badminton Players: A Cross-Sectional Study. *Medicine*, 2019;*98*(2).
2. Spurrs, R. W., Murphy, A. J., & Watsford, M. L. The Effect of Plyometric Training on Distance Running Performance. *European journal of applied physiology*, 2003;*89*, 1-7.
3. Radnor, J. M., Moeskops, S., Morris, S. J., Mathews, T. A., Kumar, N. T., Pullen, B. J., ... & Lloyd, R. S. Developing Athletic Motor Skill Competencies in Youth. *Strength & Conditioning Journal*, 2020;*42*(6), 54-70.
4. Burhaein, E., Ibrahim, B. K., & Pavlovic, R. The Relationship of Limb Muscle Power, Balance, and Coordination With Instep Shooting Ability: A Correlation Study in Under-18 Football Athletes. *International Journal of Human Movement and Sports Sciences*, 2020;*8*(5), 265-270.
5. Koçyiğit, B., Kumartaşlı, M., Orhan, H., & Yılmaz, E. Badminton Antrenmanlarının Dikkat Düzeyi ve Reaksiyon Zamanı Üzerine Etkisinin İncelenmesi. *Çanakkale Onsekiz Mart Üniversitesi Spor Bilimleri Dergisi*, 2020;*3*(2), 40-54.
6. Demirci, A., & Demirci, N. Adım adım badminton. *Ankara: Spor Yayınevi*. 2007.
7. Özgür, B. 10-14 Yaş Türk Badminton Oyuncularının Bazı Antropometrik ve Motorik Performans Özellikleri. *Spor Hekimliği Dergisi*, 2020;*55*(3), 222-230.
8. Akpinar, S., Devrilmez, E., & Kirazci, S. Coincidence-Anticipation Timing Requirements are Different in Racket Sports. *Perceptual and motor skills*, 2012;*115*(2), 581-593.
9. Williams, L. R. T., & Walmsley, A. Response Timing And Muscular Coordination in Fencing: A Comparison Of Elite and Novice Fencers. *Journal of science and medicine in sport*, 200;*3*(4), 460-475.
10. Kaplan, D. S., Akcan, F., Çakir, Z., Kilic, T., & Yildirim, C. Visuomotor and Audiomotor Reaction Time in Elite And Non-Elite Badminton Players. *European Journal of Physical Education and Sport Science*. 2017; *3*(1), 84-93.
11. Kaya, M. Effect of Reaction Developing Training on Audio-Visual Feet Reaction Time in Wrestlers. *International Journal of Environmental and Science Education*, 2016;*11*(10), 3251-3257.
12. Bıdıl, S., Arslan, B., Bozkurt, K., Düzova, S. C., Örs, B. S., Onarıcı Güngör, E., & Şimşek, D. Investigation of the Effect of Badminton-Specific 8 Week Reaction Training on Visual-Motor Reaction Time and Visual Cognitive Dual Task. *Turkiye Klinikleri Journal of Sports Sciences*, 2021;*13*(1).
13. Kuan, Y. M., Zuhairi, N. A., Manan, F. A., Knight, V. F., & Omar, R. Visual Reaction Time and Visual Anticipation Time Between Athletes and Non-Athletes. *Malaysian Journal of Public Health Medicine*, 2018;*1*, 135-141.
14. Dube, S. P., Mungal, S. U., & Kulkarni, M. B. Simple Visual Reaction Time in Badminton Players: A Comparative Study. *National Journal of Physiology, Pharmacy and Pharmacology*, 2015;*5*(1), 18-20.
15. Di, X., Zhu, S., Jin, H., Wang, P., Ye, Z., Zhou, K., ... & Rao, H. Altered Resting Brain Function And Structure in Professional Badminton Players. *Brain connectivity*, 2012;*2*(4), 225-233.
16. Ak, E., & Koçak, S. Coincidence-Anticipation Timing and Reaction Time in Youth Tennis and Table Tennis Players. *Perceptual and motor skills*, 2012;*110*(3), 879-887.
17. Alaei, F. (2015). *Effects of exercise intensity and stimulus speed on coincidence anticipation timing with respect to gender in adolescent badmington players* (Master's thesis, Middle East Technical University).
18. Arslanoğlu, E., Aydoğmuş, M., Arslanoğlu, C., & Şenel, Ö. Badmintoncularda Reaksiyon Zamanı ve Denge İlişkisi. *Beden Eğitimi ve Spor Bilimleri Dergisi*, 2010;*4*(2), 131-136.
19. Birinci, Y. Z., Şahin, Ş., & Pancar, S. Investigation of the Reaction Times of 13-14 Years Old Video Game Players and Racket Athletes. *European Journal of Physical Education and Sport Science*. 2018; *4*(1), 119-131.