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INVESTIGATION OF THE EFFECT OF FATIGUE ON SMOOTH HIT AND SPEED IN FOOTBALL

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ABSTRACT

This study was conducted with the participation of 15 volunteer male football players aged 19-20 in Van amateur league and the effect of fatigue on shooting accuracy and shooting speed was examined. To cause fatigue in the athletes, the shuttle run test was applied. The age, height, weight, shuttle numbers, body mass indexes and pre-test post-tests of the players were measured. Results were analyzed by SPSS 22.0

This study aims to investigate the effect of fatigue on football hit and shoot speed. For this purpose, one of the biggest factors of winning in football is to examine the impact of the shot on the hit and hit with fatigue and to investigate the methods of minimizing the negativity.

As a result; According to the criteria determined in the study, fatigue caused a decrease in stroke hit and stroke speed. It has been found that the success rate of strokes decreases with the fatigue

Key Words: Football, Hit, Exhaustion

ÖZET

Bu çalışma Van amatör liginde oynayan yaşları 19-20 olan 15 gönüllü erkek futbolcunun katılımıyla yapılmış olup yorgunluğun şut isabeti ve şut hızı üzerine etkisine bakılmıştır. Sporcularda yorgunluk oluşturmak için mekik koşusu testi uygulanmıştır. Çalışmaya katılan futbolcuların yaş, boy, ağırlık, mekik sayıları, vücut kitle endeksleri ile ön test son testleri ölçülmüştür. Sonuçlar SPSS 22.0 Paket programda analiz edilmiştir

Bu çalışmanın amacı futbolda yorgunluğun şut isabeti ve şut hızı üzerine etkisinin incelenmesidir. Bu amaçla futbolda kazanmanın en büyük etkenlerinden birisi olan şutun yorgunlukla beraber vuruş ve isabetteki etkisini inceleyip olumsuzlukları en aza indirmenin yöntemlerini araştırmaktır.

Sonuç olarak; çalışmada belirlenen kriterlere göre yorgunluğun, vuruşisabetinde ve vuruş hızında azalmaya neden olduğu tespit edilmiştir. Vuruşlardaki başarı oranının, oluşan yorgunlukla birlikte düştüğü ortaya çıkmıştır.

Anahtar Kelimeler: Futbol, İsabet, Yorgunluk

1. INTRODUCTION

Football is the most popular team sport in the world in different categories such as men, women, adults and children at different levels of expertise (Bangsbo, 1994). Football played in a large game is a sport in the park of his place from the outside of the hand, characterized by the goals of the game, in an area restricted by the rules of the game with the participation of the multiplayer (Inal, 2004). The key to success in football depends on finding players who are gracefully suitable for football and improving their performance. Today's football is based on more complex technical skills, the development of tactical thinking and the increase in physical needs. Football, aerobic and anaerobic exercises

consecutively used force, speed, endurance, flexibility, coordination, speed and balance of factors such as intertwined is considered a sport (Gunay and Yuce, 2001; Pancar, Bozdal, Bicer and Akcan, 2017).

Performance in football depends on many factors such as cardiovascular fitness, muscle strength, endurance, flexibility, agility, coordination, skill and tactics (Reilly, 1996). Of these factors, it is known that technical skills and endurance capacities are of great importance in competition performance. In ball games, performance is more difficult to assess than individual sports. In such sports, the results of the competition are evaluated by the points scored, the sets received and the goals scored. This shows that the winner in the football game is "scoring more goals than his opponent." (Carling, Williams and Reilly, 2005; Karadag, Cinar and Oner, 2018). Therefore, technical skills need to be constantly developed and improved in order to achieve results and improve the ability to score goals in football (Lees and Nolan, 1998; Yamaner, Cinar, Oner, Turgut and Yamaner, 2018). Shots on goal are one of the technical skills necessary to score goals during the competition and are related to the strokes technique, which increases the likelihood of scoring and winning the match when performed with a smooth strokes technique (Reilly, 1996; Selcuk, Cinar, Sarikaya and Oner, 2018). Compared to the opposing team, the team can score more goals in the goal and has the chance to score more goals and win the match (Kellis and Katis, 2007; Cinar, Akbulut, Oner, Pancar and Karaman, 2016)

The type of exercise in football is intermittent. Changes in aerobic or anaerobic activity occur every 4 to 6 seconds. An international football player performs approximately 1350 activities including 220 high-speed runs during a game (Mohr, Krstrup and Bangsbo, 2003). In addition to running, the players perform activities using different energy systems, such as dribbling, sliding intervention, head-beats and dual challenges (Bangsbo, 1994; Reilly, 1997). This indicates a high need for both aerobic and anaerobic power and capacity during play. During the game, aerobic energy is needed which is on average 75% of the maximal oxygen utilization capacity. This information indicates that an effort is required at the level of the anaerobic threshold load during the football competition. Fatigue means a person's inability to sustain the expected or required power generation (Mohr, Krstrup and Bangsbo, 2005). In another definition, fatigue is defined as an indication of a decrease in maximal strength required to maintain exercise and consequently a decrease in performance (Reilly, 1994). Researches show that; Regardless of the type of exercise, the duration of the workload increases and the duration of the power is shortened. Inability to provide the necessary power for a particular exercise is expressed as fatigue (Edwards, 1983). At the end of fatigue, a good recovery capacity is required to be able to repeat the activities required for performance. This is possible by having good aerobic stability (good anaerobic threshold). For these reasons, fatigue in football and its mechanisms are very important in maintaining and improving performance. Sports scientists and experts have long thought that fatigue is the most important factor limiting human performance. They investigate the sources of fatigue and work to overcome their negative effects on performance (Bompa, 1999). Studies show that sprinting is higher in the first half than in the second half, in addition to high-intensity running and distances covered (Bangsbo, Norregard and Thorsoe, 1991; Mohr et al, 2003).

2. METERYAL METHOD

This study consisted of 15 volunteer participants aged 19-20 in Van amateur league. The study aimed to create fatigue on athletes by applying the shuttle run test. At the beginning and end of the shuttle run, a total of 6 shots were shot at 2 parts per section in the designated areas of the castle with a distance of 16 m. In order to measure the effect of fatigue on the shot speed, 1 shot was taken before and after the shuttle run test using a radar device. As a result, after the fatigue athletes' shooting hits and changes in shooting speed were recorded. The pulses in each section were repeated 6 times for 30 seconds to 1 minute. The strokes were made using 435 g (410-450 g) soccer balls in accordance with the rules of the game determined by the FIFA. According to the test protocol, the castle was divided into 6 equal areas. The players were instructed to target the top right and left points first. According to the strokes, the hits that hit the right and left regions were evaluated as 3 points, the middle upper region and poles as 1 point and the hits that hit the lower regions and outward points were evaluated as non-point.

Football Goal of Segmented

Successful (3 point)	Successful (1 point)	Successful (3 point)
Unsuccessful	Unsuccessful	Unsuccessful

Goal post 1 point, 7,32 metres, 7,44 wide

2.1. Selections of Participants

Participants were formed by 15 volunteer athletes aged 19 to 20 playing in the amateur league.

2.2. Tests and Measures Applied to Participants

Body mass indexes (BMI) were calculated by measuring body weight and height. The tests and measurements applied to the athletes participating in the study are given below.

2.3. Height and Weight Measurement

The athletes' body weights were measured using digital scales with shorts. The values are recorded in kilograms (kg). The lengths of the athletes were measured using meters, bare feet, feet flat on the floor, heels adjacent, knees stretched and body upright. Values are recorded in centimeters (cm).

2.4. 20 Metres Shuttle Running Test

Before starting the test, the athletes were informed about the test. The athletes ran a distance of 20 m round trip. The running speed is periodically played with a sound grenade that sounds a signal. The athlete started to run with the first beep. He must reach the other line until the second he hears. When he heard the next beep, he was back in the starting line. The speed, which was slow at first, gradually increased every 10 seconds. When the athlete missed a signal and reached another, he continued the test. The test was terminated for that person when the athlete could not reach the two signals in a row. At the end of the test, each athlete's shuttle numbers were recorded. (Cinar, Akbulut, Oner, Pancar, Karaman, 2016).

3. FINDINGS

The average age, height, weight, body mass index and number of shuttles of the participants were given in the table below.

Table 1. Demographic Information

Variables	N	Min.	Max.	Mean	Std. deviation
Age (year)	15	19	20	19.53	0,516
Height (cm)	15	168	185	175	0.06
Body weight (kg)	15	62	80	68,4	5,84
Body mass index	15	19,8	24	22,1	1,02
Number of shuttles	15	103	123	112,8	5,906

Table 1 shows information about the descriptive characteristics of the athletes participating in the study. It was determined that the age of the participants was 19.53 and a minimum 19 and 20 average. The information about the height was determined to be minimum 168 cm and maximum 185 cm, and average 175 cm. Information on their weights was found to be 68.2 if the average of minimum 62 kg maximum 80 kg. It was found that the information about body mass indices is minimum 19.8 and maximum 24 is 22.1. Information on the number of shuttles of the athletes was observed to be minimum 103 maximum 123 average 112.8.

Table 2. Shoot Hit Table

	N	Min.	Max.	Mean	Std. deviation	T	P
Pre-test Hit	15	7	14	10	2,070	14,210	,000
Post-test Hit	15	3	9	5,73	1,668		

It was observed that there was a statistically significant result between the pre-test and post-test comparisons of the athletes participating in the study. It was observed that pre-test values were higher than post-test values.

Table 3. Running Test Table

	N	Min.	Max.	Mean	Std. deviation	T	P
Pre-test Running	15	87	99	94,60	4,085	7,359	,000
Post-Test running	15	81	92	87,60	4,171		

It was observed that there was a statistically significant result between pre-test and post-test in the comparison of pre-test speed-posttest speed of the athletes participating in the study. It was observed that pre-test values were higher than post-test values.

4. DISCUSSION

In this study, the effect of fatigue on shooting accuracy and shooting speed was examined, and before the fatigue and fatigue formation, athletes were hit. As a result of these strokes, the effect of fatigue on shot accuracy and speed was analyzed with SPSS 22.0 package program. Aerobic capacity is an important factor affecting performance in sports requiring endurance (Karamizrak, 1994 ; Selcuk, Cinar, Sarikaya, Öner, Karaca, 2018). In football, the exercises that occur in the game are seen as more anaerobic content, but the 90-minute playing time makes aerobic capacity valuable (Gunay and Yuce, 2001). The best method of determining aerobic capacity is to determine the maximal oxygen consumption (maxVO₂) available to the individual in one minute (Akgun, Pindur & Müller 1983; Pancar, Ozdal and Cinar, 2017; Selcuk, Bilen, Temur, Oner and Kinaci, 2017). The mean maxVO₂ values of the participants were 64 ± 4.77 ml / kg / min. In their study, while determining the maxVO₂ values of the players, 61.1 ± 4.6 ml / kg / min, Stroyer, Hansen and Hansen(2004), They reported that the average value of 58.6 ± 5.0 ml / kg / min in Danish players (Helgerud, Engen, Wisloff and Hoff, 2001; Oner, Ozbar, Cinar, Kilic and Olcucu, 2016), They found that the average maxVO₂ values of the young players were 58.1 ± 4.5 ml / kg / min and that the average value of the professional players was 60.5 ± 4.8 ml / kg / min. Drust, Reilly and Cable (2000), seven British university football team players have an average of 57.8 ± 4.0 ml / kg / min. Wisloff, Helgerud and Hoff (1998), they found that the average value of the players of the football team players who completed the Norwegian league in the first place was 67.6 ± 4.0 ml / kg / min. Faina, Gallozzi and Lupo (1988), found that the average value of amateur football players was 64.1 ± 7.2 ml / kg / min and 58.9 ± 6.1 ml / kg / min. Shuttle run test was applied to cause fatigue in the study. As a result; In the study, it was observed that fatigue caused a decrease in stroke hit and stroke speed according to the determined criteria. It was found that the success rate of the strokes decreased with the fatigue. It is useful to repeat this study using different methods and materials.

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