

## Investigating Women Futsal and Soccer Players' Acceleration, Speed and Agility Features

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**ABSTRACT** The present study aims to examine the agility, speed and acceleration features in women futsal and women soccer players. A total of 70 volunteers including 35 futsal ( age,  $20.85 \pm 1.88$  years; height,  $166.85 \pm 4.57$ cm; weight,  $61.74 \pm 9.07$ kg ) and 35 football players (age,  $20.40 \pm 3.34$  years; height,  $165.02 \pm 7.66$  cm; weight,  $60.98 \pm 6.76$  kg) participated in the study. The training ages of the futsal and soccer players were  $6.08 \pm 1.44$  years and  $5.77 \pm 3.26$  years, respectively. The participants' 10 meter, 20 meter and 30 meter agility and acceleration values were measured using the New Test Power Timer measurement instrument. The SPSS 17.00 package program was used to evaluate the data. An independent sample test was performed on independent groups to determine the differences between them. The results indicated that woman futsal players' 10 meter, 20 meter and 30 meter speed and agility values were significantly higher than women soccer players.

### INTRODUCTION

From the word of Portuguese Futebol De Salao or Spanish Futbol De Salo, futsal is the new face of FIFA and UEFA and it is an indoor game played by five people (Göral 2014). Futsal is another version of football that is played with five players in small and closed areas. It is played by over one million players worldwide and it is a growing sport in many countries. It was first played in South Africa in 1930 and the first World Futsal Championship was held in Brazil in 1982. Since 1989, Futsal World Championship has been performed with the cooperation of the International Football Federation (Junge and Dvorak 2010).

Futsal is an intermittent high-intensity sport that taxes both aerobic and anaerobic pathways (Barbero et al. 2009). The performance of the soccer player is determined by many abilities, capacities and qualities that are completely interdependent (Hoff 2005; Weineck 2000). The futsal players basically need endurance, speed, located muscular resistance and muscular potency (Santos 1998). Furthermore, the reduced pitch dimensions and the frequent turnovers during futsal match requires the players' fast decision-making and high sprint capabilities under pressure during attacking and defending phases (Vaeyens et al. 2007)

In fact, when compared with soccer, futsal players' technical competence is higher than football players. Playing with a ball, which bounces less than thirty percent is a hard task for the play-

ers to control and to carry it around fast. It is thought that the characteristic features of the branch reflect to the athlete's physical and physiological capacity.

Speed is the most important motor feature that is needed in a sport and it is expressed in mechanical terms with the ratio between distance and time (Ziyagil 1994). To be good, speed values are closely associated with the acceleration. Acceleration is the exchange ratio in speed, which provides the player the ability to reach maximum speed in a minimum amount of time. For the athletes to be successful, it is important to effectively reach the maximum running speed and acceleration (Murphy et al. 2003). This sprint format, which also has an important place in soccer comes to the forefront with very short and sudden change in directions as in straight running (Özkara 2002). There are obvious advantages of reaching a maximum speed earlier or having a great acceleration in many sports (Okur 2011). It is thought that developed acceleration and speed increases the mobility of the athletes.

An athlete's agility, which is known as the fast movement of the body and the changes in the directions and motions is the basic component in team sports such as futsal and soccer (Milanovic et al. 2011). During a soccer match the players often perform activities such as sprinting or quickly changing direction. Soccer and futsal can be categorized as requiring actions, which need high speed actions, acceleration, maximum speed or agility (Milanovic et al.

2011). Too many studies have been carried out to identify the characteristics of athletes in different sport branches. While the researchers are trying to identify the physical, physiological and psychological values of high-level athletes' that they need to be successful (Uđrađ et al. 2002), they always give more importance to researches about physical properties, acceleration, speed and agility. These motoric features come to the forefront in both futsal and soccer.

Development of basic motor abilities is important in soccer and futsal branches such as all branches. Although soccer is considered a male sport, in recent years many young girls and women are participating in soccer activities in the world and the country (Sezgin et al. 2011). Despite female soccer players achieving much in a short time, it is observed that they have not reached an expected level of performance in the international area (Göksu and Yüksek 2003). Also, soccer research in exercise science has focused on men's soccer, while female's soccer has been under-represented in training studies, as well as in studies focusing on physiological variables (Brooks et al. 2013). In addition to this, there are extremely limited scientific studies on women futsal players. It is thought that with the results of scientific studies, which will be held on female football and futsal players, the rate of development in this field is likely to increase. In this context, the purpose of this study is to identify the properties of women soccer and futsal players' acceleration, speed and agility.

## METHODOLOGY

A total of 70 females participated in this study. Of these, 35 of the participants were from two university female futsal teams playing in Unileague and the other 35 athletes were from two female soccer teams playing in Female 1<sup>st</sup> League.

### Height and Body Weight

Weight was measured using an electronic scale with a sensitivity of 0.1 kg and the height was measured using a digital length measuring instrument at 0.01 cm sensitivity (Tamer 2000).

### 10 meter – 20 meter Acceleration of Speed Testing

The test was performed by taking the best test of 2 intermittent resting in halls about 10

meter and 20 meter areas that the departure and arrival lines are determined and precision 0.01 photocells (New test Power timer) are placed at the starting (**origin**) and ending points (Özkara 2002; Tamer 2000).

### 30-meter Speed Test

A 30-meter speed test was performed in a hall with 0.01 precision photocells (New test Power time) that are placed at the starting (origin) and ending points at a distance of 30 meters in the hall (Özkara 2004).

### Illinois Agility Test

The test track, which consist of 3 cones that are lined up in a straight line at 5 meter width, 10 meter length and 3.3 meter intervals in the middle section was established in the gym. The test consists of slalom jogging by turning by 180 degree in 10 meter, 40 meter flat and 20 meter jogging between cones. After the preparation of test track, photocell electronic timer system with two doors, which measures with 0.01 sensibility (New test Power timer) was placed at the starting (origin) and ending points. The subjects were set out from the starting line in prone position and hands at the shoulder length by touching the floor. Trails finishing time was recorded in seconds. The test was repeated twice and the best rate was recorded (Hazir 2010).

### Statistical Analysis

The statistical package SPSS (17.0) was used for the analysis. Data was presented as mean values and standard deviations. To determine the difference in means between the groups, the independent sample t-test was applied to independent groups and the significance level was taken as  $p < 0.05$ .

## RESULTS

The participating futsal players' mean age was recorded as  $20.85 \pm 1.88$  year, the average height was  $166.85 \pm 4.57$  cm, the average weight was  $61.74 \pm 9.07$  kg, and training mean age was  $6.08 \pm 1.44$  years (Table 1). On the other hand, the soccer players' mean age was  $20.40 \pm 3.34$  years, the average height was  $165.02 \pm 7.66$  cm, the average weight was  $60.98 \pm 6.76$  kg and their training mean age was found to be  $5.77 \pm 3.26$  years.

**Table 1: Physical properties of futsal players and soccer players**

Variables	N	Futsal	N	Soccer
		Average + sd		Average + sd
Age (year)	35	20.85± 1.88	35	20.40± 3.34
Height (cm)	35	166.85± 4.57	35	165.02± 7.66
Weight (kg)	35	61.74± 9.07	35	60.98± 6.76
Training Age (year)	35	6.08± 1.44	35	5.77± 3.26

As shown in Table 2, the futsal players' 10-meter (1.60±0.11), 20 m. (2.98±0.20) acceleration, 30-meter (4.16±0.39) speed and agility (16.99±0.55) mean values were significantly higher than the soccer players' 10-meter (1.87±0.12), 20-meter (3.30±0.16) acceleration, 30-meter (4.84±0.23) speed and agility (17.50±0.74) mean values.

**Table 2: Futsal and soccer players' 10m-20m and agility test degrees and statistical analysis**

Variables	Futsal	Soccer	t
	Average ± sd	Average± sd	
10 m	1.60+ 0.11	1.87+ 0.12	9.555*
20 m.	2.98+ 0.20	3.30+ 0.16	7.104*
30 m.	4.16+ 0.39	4.84+ 0.23	8.816*
Agility	16.99+ 0.55	17.50+ 0.74	3.255*

\*p <0.05

**DISCUSSION**

While there are several studies evaluating the different characteristics of female athletes, there is a limited number of studies examining the properties of female futsal and soccer players. This study was carried out with the purpose of investigating the properties of acceleration, speed and agility of futsal and soccer players. The participant futsal players' mean age was recorded as 20.85 ± 1.88 year, the average height was 166.85 ± 4.57cm, the average weight was 61.74 ± 9.07kg, and the training mean age was 6.08 ± 1.44 years. On the other hand, the soccer players' mean age was 20.40 ± 3.34 years, the average height was 165.02 ± 7.66 cm, the average weight was 60.98 ± 6.76 kg and their training mean age was found to be 5.77 ± 3.26 years.

Harmanci et al. (2013) identified in their study that the female futsal players' mean age was 21.17 ± 1.27 years, their average height was 166.33 ± 6.09 cm, and body weight was 57.14 ± 6.57 kg.

In their study of female soccer players, Gök-su and Yükses (2003) identified that the soccer

players' mean age was 22.2 ± 3.0 years, average height was 164.2 ± 5.8 cm, and body weight was 59.7 ± 8.6 kg. Polman et al. (2004) identified that the players' mean age was 21.2 ± 3.1 years, their average height was 165.0 ± 0.05 cm and their body weight was 65.7 ± 7.5 kg. The average of the values shows parallelism with this study. With the determination of these values, a general feeling about the physical characteristics of female athletes who are interested in soccer and futsal branch is expected to occur.

The participant futsal players' acceleration speed values were found as 1.60 ± 0.11 m/sec in 10 meters, 2.98 ± 0.20 m/sec acceleration value in 20 meters, 4.16 ± 0.39 m /sec speed value in 30meters and their agility test values were 16.99 ± 0.55 m/s. On the other hand, the soccer players' acceleration values were found as 1.87 ± 0.12 m/sec in 10 meters, 3.30 ± 0.16m/sec acceleration speed values in 20 meters, 4.84 ± 0.23m/sec speed values in 30m eters and their agility test values were 17.50.

In their study of female futsal players, Harmanci et al. (2013) determined that their 20 meters speed value was 3.43±0,19 m/sec. However, Gök-su and Yükses (2003) determined that the female players' 20-meter speed values were 3.86±0.08 m/sec. Considering these two studies, it was seen that the female futsal players' 20-meter speed values are better than female soccer players'. These results definitely supports this work.

In a study of female athletes dealing with different branches, Atan et al. (2012) determined that female soccer players' 10-meter acceleration speeds were 2.27±2.29m/sec and their speed values were 5.85±0.24 m/sec. In his study of trained athletes, Oguz (1993) advocated that for an upper-level trained female athlete, a mean speed of 4.44 seconds at 30 meters was very well of a value. In studies with female soccer players', the average speed values are similar to the average values obtained in this study.

In their study of Effective Conditioning of Female Soccer Players, Polman et al. (2004) determined that female soccer players' 25-meter sprint value was  $4.33 \pm 0.12$ . In another study on relationships between sprinting, agility and jump ability in female athletes, Vescovi et al. (2008) reported the values as 9.1 meters  $1.96 \pm 0.10$ , 18.2 meters  $3.33 \pm 0.15$ , 27.3 meters  $4.63 \pm 0.21$ , and 36.6 meters  $5.94 \pm 0.28$  sec. Furthermore, Vescovi et al. (2011) identified 27.3 meters,  $5.94 \pm 0.25$ , 36.6 meters,  $6.24 \pm 0.28$  seconds in their study of Physical Performance Characteristics of High-level Female Soccer players between 12-21 years of age. As suggested in this study, the average speed values may form a general opinion about women soccer's speed. In their study of Talent identification and Female Soccer: An Australian experience, Hoare and Warr (2000) determined the woman soccer's sprint values as 10-meter  $2.08 \pm 0.18$ , 20-meter  $3.63 \pm 0.23$ , 10-meter  $2.08 \pm 0.18$ , and 20-meter  $3.63 \pm 0.23$ . In their study on Acceleration Capacity in Futsal and Soccer Players, Matos et al. (2008) determined that the futsal players' acceleration speed ( $1.53 \pm 0.23$ ) is better than the soccer's ( $1.79 \pm 0.07$ ).

In his study of investigating the acceleration and agility features of futsal and soccer players, Goral (2014) determined that futsal players' 10-meter acceleration speed values were  $1.73 \pm 0.05$  m/sec, 20-meter acceleration speed values were  $3.19 \pm 0.07$  m/sec and agility test values were  $14.71 \pm 0.45$  m/sec, while soccer's 10-meter acceleration speed values were  $1.81 \pm 0.07$  m/sec, 20-meter, acceleration speed values were  $3.21 \pm 0.07$  m/sec and agility test values were  $15.31 \pm 0.78$  m/sec. This study's findings regarding the speed values at 10 meter and 30 meters are in agreement with Goral's results.

In this study, looking at the speed values of 10 meters and 20 meters, they were similar to the speed values in the present study. Looking at the agility values, it was determined that futsal players' values were better than soccer's, this was a great achievement of the study. The reason why the woman futsal players' acceleration, speed and agility values are better than soccer's can be considered as the effect of the characteristic features of the branch on the athletes. As a result, it was identified that female futsal players' acceleration, speed and agility values are statistically different from female soccer players' values.

## CONCLUSION

The reason why the female futsal players' acceleration, speed and agility values were better than soccer's can be considered as the effect of characteristic features of the branch on the athletes. As a result, it was identified that the female futsal players' acceleration, speed and agility values are statistically different from female soccer players' values.

## RECOMMENDATIONS

In similar studies, female futsal players and female soccer players with different physical, physiological and motor characteristics can be compared. At the same time, male futsal players and male soccer players can be compared in relation to sex in the same categories or aspects.

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