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Evaluation of the Physical Capacities of Pre-Season and End-Season Futsal Players

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Abstract

The aim of the study is to evaluate the physical parameters of the futsal players before and after the season. In the study, the experimental group consisted of n = 10 male futsal players with an average age of 20.5±1.5 years, height 1.78±.03 cm, body weight 71.7±2.2 kg. The control group consisted of n = 10 male futsal players with an average age of 22.1±2.4 years, height 1.78±.03 cm, body weight 74.3±4.4 kg. Paired-T test was applied to pretest and posttest data for statistical analysis. There was no statistically significant difference in the weight, 30 m speed, 10 m speed, vertical jump, horizontal jump, anaerobic strength and shot velocity values of the experimental group. There was no statistically significant difference in the control group's weight, 30 m speed, 10 m speed, vertical jump, horizontal jump, anaerobic force, shot velocity values.

Keywords: Futsal, Physical parameter, Anaerobic force

1. Introduction

Similar to the narrow field game in football, the rapidly developing futsal started to be played in the first quarter of the 20th century (Rodrigues et al., 2011). This sport, represented and managed within the FIFA organization, is played in many international countries in professional and amateur leagues in the category of women and men (Barbero-Alvarez et al., 2009). Designed for futsal salon sports, having professional and amateur leagues in its category, it is widespread in many international countries and its awareness is increasing every passing day (Barbero-Alvarez et al., 2008).

(a) The reason for that why is this problem important? Basically it Because No previous study was found in the literature review In order to form a basis for the next season and to establish the goals more systematically, it should be determined whether the physical parameters of the futsal players differ statistically at the level of the season.

(b) How does the study relate to previous work in the area? When the studies carried out so far are examined, it is noteworthy that there are no similar international studies and this issue has not been investigated adequately.

No national or international study has been found. Futsal players show top performance throughout the season during matches. League matches are always difficult in all sports branches. Futsal players must come ready to their team to start the season in well condition. Because, futsal players need strong physical capacity in these challenging matches

It will be easier for them to come ready for their teams and reach their goals during league matches with the effect of pre-season training and league matches.

During league matches, futsal players often stay away from a comprehensive training practice. On the other hand, high-level combat, dribbling runs, etc. League matches with tough performance is a training for futsal players.

1.2 Importance of the Research

Although no similar work has been done, Dominant foresight of coaches and sports circles that futsal players return to teams with physical capacity high in pre-season and physical parameters are not falling at the end of season. Similar studies have not been seen in the literature review conducted so far. In this context, we will investigate and evaluate the physical capacities of futsal players before and after the season. By keeping track of whether the physical capacity of futsal players is statistically significant, it will also give the chance to evaluate the place of the team in the league and the test data of the athletes. We can get a chance to investigate the reasons for the possible low performance before and after the season by looking at the positions of the other teams in the league.

In this sport, where physical capacity limits are extremely difficult, athletes' physical and physiological capacities are required to be developed at a high level. Futsal players are faced with many challenges before and after each league season, while they are expected to perform well in each match, they are expected to return very ready in terms of physical and physiological capacity before the start of the new season. In recent years, many sports branches are being played quickly, with skilled athletes, and great importance is attached to improving their physical and physiological capacities. There is no big difference between the physical parameters of the team athletes who successfully put forward the struggle throughout league competitions between the pre-season and the end of the season. The reason for this positive situation can be attributed to many different factors such as coaches and trainer, but the need for the athlete to pay attention to his own performance should not be overlooked. The high performance of athletes affects no difference between physical capacities before and after the league, or a significant difference due to the effect of training. For this reason, expectations of sportsmen gathered around certain goals, even an experimental research that can enable teams to reach this goal, are increasing each passing period. While the physical performance of athletes can vary during the league, it should be considered as the value that determines the course of the matches during all season games and naturally affects the ranking of the teams in the league. At this point, the importance of

evaluating the physical parameters of athletes before and after the league becomes apparent. With the high quality and challenging league, the high pace of the matches, the fact that the rival teams are made up of strong and talented players, as well as similar factors are among the reasons for the fall in the physical parameters of futsal players. Physical struggles between athletes determine the outcome of the match. Even a single physical parameter put forward by the athlete can disrupt the balance that will determine the outcome of the matches. Competition increases between clubs and athletes as the futsal has a slow and slow economic power. The decisive features of performing successfully and maintaining it during the short futsal league depend on the strong physical capacity of futsal players. Futsal is a sport that requires instant accelerations, short sprints, agility actions at maximal speed (Berdejo-del-Fresno, 2012; Gambetta, 1996). Futsal players make sudden accelerations, high sprints, forward moves, many jumps, faster spins, and numerous shoot. The decrease in the physical parameters of the athlete on the football triggers match fatigue and decreases the performance (Castagna et al., 2009; De Oliveira Bueno et al., 2014). In today's active sports futsal, it is very important to test the strength of the physical parameters that will continue the skill of the futsal players without reducing his performance for a long time, and to determine his limits clearly (masculine). In order for athletes to perform strongly, their physical parameters must also be in good condition.

The aim of this study is to compare and analyze the physical parameters of futsal players before and after the season. This study will allow the clear definition of the physical parameter status of the futsal players, starting the pre-season training and the end of the short futsal league.

2. Method

2.1 Study and Control Group

The aim of the study is to evaluate the physical parameters of the futsal players before and after the season. Experimental group athletes (n = 10) started working at the beginning of the season (6 weeks ago) for league matches (4 days) and regularly worked 3 days a week until the futsal matches.

Experimental group played league (4 days) matches every day after 6 weeks of regular training. The control group (n = 10) did not perform any sporting activities.

In this research, study group consisted of n = 10 male futsal players with an average age of 20.5±1.5 years, height 1.78±.03 cm, body weight 71.7±2.2 kg. Control group consisted of n = 10 male futsal playerss with an average age of 22.1±2.4 years, height 1.78±.03 cm, body weight 74.3±4.4 kg.

According to the research, specific tests were applied to the participants before and after the research in order to evaluate the physical parameters. Before the tests, 15 minutes warm-up program was applied to the athletes.

Experimental group pre-season training program; Workouts were carried out 3 days in a week.

(a) Day 1. Training Program

a1) Basic technical studies, passes, in-foot, on-foot, collective games, dribbling, ball control, dribble with/without ball;

a2) Tactical studies; offensive and defensive games, playing from the edge and corner, playing in foul shots.

(b) Day 2 Training Program

b1) Preparation match; a friendly match was held regularly every week.

(c) Day 3 Training Program

c1) 1500 m × 2 sets;

c2) 1000 m × 2 sets;

c3) Tactical training; offensive and defensive games, tactical preparations, corner exercises, foul shots, 1v1, 2v2, 3v3 drills.

2.2 Collection of Data

Vertical jump; participant stands upright with the shoulders wide, while the upper limb is upright, With the knees bent at 90° and the arms bent at the elbow, participant makes a mx. jump upwards with all his strength. This test is applied to each participant 2 times and the best score of participant is noted. TKK 5406 jump-meter equipment was used for vertical jump test.

Horizontal jump; participant jumped from the designated line to the farthest distance that he could do. The distance between the bounce line and the point where participant jumped was measured and noted. This test is applied to each participant 2 times and the best score of participant is noted. Horizontal jump values (cm) are noted using tape measure (Sevim, 1997).

Anaerobic power; anaerobic power was determined by applying Lewis formula (kg-m/sec) to the data which was found by determining participant's weight (body weight) and leap degree.

$$P = \sqrt{4.9} \times \text{Body Weight} \times \sqrt{D} \quad (1)$$

where, P = Anaerobic Power (kg-m/sn); D = Vertical jump (cm).

10 m. sprint test; participant started 10 m. sprint at maximum speed from the starting line and ended the speed test at the finish line. With the photocell device, time of participant is determined and noted (sn). This test is applied to each participant 2 times and the best score of participant is noted. Newtest 300-Finland equipment used for 10 m sprint test.

30 m. sprint test; participant started 30 m. sprint at maximum speed from the starting line and ended the speed test at the finish line. With the photocell device, time of the participant is determined and noted (sn). This test is applied to each participant 2 times and the best score of participant is noted. Newtest 300-Finland equipment used for 30 m sprint test.

Shot velocity; shot velocity tests are applied in the futsal field. Participants, after running 3-4 steps, kicking the midpoint of the futsal ball placed on the penalty spot with instep kick of the dominant foot at the maximum speed. This test is applied to each participant 2 times and the best score of participant is noted. Shot velocity measurements of the participants were determined with the "Pocket Radar Ball Coach/Pro-Level Speed Training Tool".

Standing height of the participants were measured by stadiometer (Holtain) device and noted the results.

2.3 Statistical Analysis

Pretest and posttest data were analyzed with SPSS-19 program. After the normality test, Paired-T test was applied to the data. Statistical significance level was taken as $p < 0.05$.

3. Findings

Table 1 Test and control group 10 m and 30 m speed test values

Test	Grup	N	$\bar{x}$	Sd	t	P
10 m. Sprint Test	Study	10	.13	.18	1.5	.08
	Control	10	.23	.01	.61	.56
30 m. Sprint Test	Study	10	.29	.18	8.9	.09
	Control	10	.53	1.4	1.6	.12

Note. No statistically significant difference was observed in the 10 m and 30 m speed test data of study and control groups ($p < 0.05$).

Table 2. Vertical and horizontal jump test values of study and control group

Test	Group	N	$\bar{x}$	S.S.	t	P
Vertical jump	Study	10	.70	1.1	1.9	.08
	Control	10	.50	1.3	1.6	.27
Horizontal jump	Study	10	2.7	8.56	1.5	0.7
	Control	10	30.6	8.9	11.1	.19

Note. There was no statistically significant difference in the vertical jump and horizontal jump test data of study and control groups ($p < 0.05$).

Table 3. Shot velocity test values of study and control group

Test	Group	N	$\bar{x}$	S.S.	t	P
Shot velocity	Study	10	1.8	3.2	1.7	.11
	Control	10	1.1	2.9	1.2	.31

Note. There was no statistically significant difference in the shot velocity test data of study and control groups ($p < 0.05$).

Table 4. Weight test values of study and control group

Test	Group	N	$\bar{x}$	Sd	t	P
Body Weight (kg)	Study	10	.54	.45	3.7	.06
	Control	10	.53	1.1	1.6	.13

Note. There was no statistically significant difference in body weight test data of study and control groups ($p < 0.05$).

Table 5. Anaerobic power values of study and control group

Test	Group	N	$\bar{x}$	S.S.	T	P
Anaerobic power	Study	10	5.8	19.4	2.9	.09
	Control	10	2.3	13.2	.55	33

Note. There was no statistically significant difference in anaerobic power data of study and control group ($P < 0.05$).

Difference between pre-test and post test given in $\bar{x}$ mean.

4. Discussion and Conclusion

The aim of the study is to evaluate the physical parameters of the futsal players before and after the season. There was no statistically significant difference in the weight, 30 m speed, 10 m speed, vertical jump, horizontal jump, anaerobic power and shot rate values of the futsal players of the experimental group ($p < 0.05$). With the statistical comparison of the pretest and posttests of the experimental group, there was an improvement in the parameters of the participants, the results were found to be compatible with the goal of the study, but these developments did not create a statistically significant difference ($p < 0.05$).

There was no statistically significant difference in control group weight, 30 m speed, 10m speed, vertical jump, horizontal jump, anaerobic power, shot rate values ($p < 0.05$).

In experimental studies involving athletes from different sports branches, different research programs are tested to participants from past to present. In some experimental studies, it was determined by the field scan that there was a statistically significant difference in the physical and physiological parameters of the participants, and in some studies there was no significant difference ($p < 0.05$). In order to reach scientific results, necessary researches and field surveys were conducted. There is no similar study in the literature related to the study we have implemented, the research we have implemented in this way is a precedent.

The research we apply in this way is a precedent. Tall size athletic structure, wide size (diameter) and certain weight levels are among the factors that will contribute to the footballers' success. When the height, body weight, and anaerobic power data of the participants were examined, it was seen that it was similar to the literature (Álvarez et al., 2009; Arnason et al., 2004). There is a similarity between the limited field and the narrow field games where the footballers struggle. Football players often go into bilateral struggles with man in a tight field by defending and attacking, accordingly, they must have high physical capacities and anaerobic power.

4.1 Anaerobic Power

As a result of our research, it was observed that the participants had high anaerobic power data. However, there was no statistically significant difference in the anaerobic power parameters of the experiment and control group participants ($p < 0.05$). As a reason, it was thought that the footballers did not have enough preparatory phases, they could not adapt to the frequent matches and they were not subjected to an elite training method. Similar to the result of our study, no statistical improvement was determined in the anaerobic power data of the participants in a different study (Erol & Sevim, 1993). In a different study, no statistically significant difference was found in the anaerobic data measurement of athletes Erdem and Yazar (2019). The recovery phase of the athlete with high anaerobic power is fast while the fatigue phase is delayed. It is stated that the athlete will exhibit fast and active performance with its anaerobic capacity (Sevim, 2010).

Unlike the results of our research, Sever and Cicioğlu (2018) determined a significant difference in the anaerobic parameters of the experimental and control groups with the study they applied to the swimmers at the beginning of the season. Low anaerobic ability has been reported to allow the athlete to fall out of play during offensive, defensive and contentious phases of the match (Wisloeff, Helgerud, & Hoff, 1998).

4.2 Vertical and Horizontal Jump

In our study, no statistically significant difference was observed in the vertical and horizontal jump parameters of the experiment and control group footballers ($p < 0.05$) (Bompa, 2001). Unlike the results of our study, a significant difference was observed in the vertical jump, horizontal jump and anaerobic power values of basketball players according to a 8-week pliometric study result (Cicioğlu et al., 1997). In cases where vertical and horizontal jumping is required, the performance of the lower extremities is anaerobic power capacity. The vertical and horizontal jump performance of the athlete depends on the anaerobic power of the leg

muscles and the jumping technique (Akçakaya, 2009). Vertical, horizontal jump, etc. It has been reported that lower extremity values have developed along with other physical parameters that have correlations for the development of values (Yıldırım, 2009). Low physiological parameters of the athlete will negatively affect his performance (Boileau & Horswill, 2002; Heyward & Stolarczyk, 1996). In addition to the study of Koç and Aslan (2010), which showed a decrease in vertical jump results as a result of the increase in the weight values of the athletes, the increase in the vertical jump results of the athletes was observed with the decrease in the weight values, but the developments did not create a statistical difference ($p < 0.05$).

4.3 10 m., 30 m. Sprint

According to the results reached by our study, 10m and 30m of experiment and control group athletes. There was no statistically significant difference in speed values ($p < 0.05$). There was an improvement in the running performances of the experimental group athletes, but these values did not create a statistically significant difference. Unlike our study, Erol and Sevim (1993) found a significant difference in the 30 m test in their study. However, in a similar study, no statistically significant difference was observed in sprint measurements of athletes (Erdem & Writer, 2019).

It has been reported that vertical jump performance, which is among the values seen as an indicator of anaerobic power, has an effect on reaction and speed (Bayraktar, 2013). As the reason for this, it can be considered that football is a sport played with a high level of anaerobic tempo and it is not similar to another sport branch in scope. According to the literature review, the similarity of football with football was noted in terms of speed (Jovanovic, Sporis, & Milanovic, 2011). The necessity of speed and speed occupies a special place in every sport branch. Speed, speed is an important feature in football as in football. Footballers use their speeds a number of times while equalizing their opponents. Throughout the match, the ball runs towards the goal, fast dribbling and the struggles to protect the ball are very sensitive in football. It has been reported that speed and speed give the football player an advantage with the ball in such moments (Foran, 2001). There is a strong correlation between anaerobic power (anaerobic parameter) and speed. Higher anaerobic power allows higher speed. High anaerobic power prepares the ground for high speed. In our study, the fact that the speed data was not statistically significant was associated with the low anaerobic power of the participants. It has been reported that there is a direct correlation between leap and speed values (YıldırımT.2010).

4.4 Body Weight (kg)

With the study, an improvement has occurred in the weight values (kg) of the experimental and control group participants. The determined development was not considered statistically significant ($p < 0.05$). Similarly, no statistically significant difference was observed in the body weight values of the athletes as a result of the study conducted by Erol and Sevimin (1993). Again, according to a different study result comparing the physical activity levels of the participants, it was reported that there was no statistically significant improvement in the body weight data of the participants (Urlu, 2014). Although no statistically significant improvement was observed in our study, it was reported in the literature that the body weight of the athlete decreased as a result of the training (Helgerud et al., 2007). With a decrease in body weight, it

will lead to an improvement in the performance of the athlete. In our study, the absence of statistical difference in body weight was seen as a direct factor in the absence of a difference in physical parameters ($p < 0.05$).

4.5 Shot Velocity

According to the results of the study, no statistical difference was determined in the smash speed results of the experiment and control group participants ($p < 0.05$). Unlike the results of our study, another study showed a statistical difference in the shooting speed values of the athletes (Chih & Ying, 2015). Similar to the results of our research, no statistically significant difference was determined in the shooting speeds of the participants in a different study (Shalfawi et al., 2014).

Strong muscle groups that participate in similar activities such as sprinting, running with sprinting, jumping also contribute to movement in the shooting phase. Most of the bouncing muscles also participate in performance during shooting. It was thought that no increase in anaerobic power and vertical jump performance thereby suppressed the statistical development of the shot rate values.

It will clearly demonstrate the effect of the training performed on the league matches by correctly analyzing the results achieved through the study. It has been seen that our country needs strategic applications for faster leaps with its newness in football. It was seen that the experimental and control groups were formed as balanced and appropriate by random method. Physical parameters of footballers are among the important factors for their careers, and therefore the importance of being developed was determined by the research conducted. The data obtained as a result of the tested parameters are thought to be seen as a starting point for more comprehensive programs and preparatory studies during the preparation phase of the league for coaches and research circles.

5. Suggestions

It is recommended to start the season preparation phase earlier and to increase the weekly training numbers.

It is recommended to increase the number of participants in future studies.

In similar studies to be conducted in the future, it is recommended that different parameters are tested and the results are examined and compared with these peer-reviewed studies.

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