COMPARISON OF CIRCULATION PARAMETERS AND SOME MOTORIC ADAPTATIONS OF FUTSAL ATHLETES AND SEDENTARIES

COMPARACIÓN DE PARÁMETROS DE CIRCULACIÓN Y ALGUNAS ADAPTACIONES MOTRICES DE ATLETAS DE FUTBOL SALA Y SEDENTARIOS

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ABSTRACT

The aim of this study is to compare the circulation parameters and some motoric adaptations of futsal athletes aged 15-17 and sedentary individuals. For this purpose, an athlete and a sedentary group was formed and a total of 30 volunteers were included in the study. Individuals were included among futsal athletes and individuals who participated in futsal auditions. Saturation, heart rate and blood pressure values were recorded in order to examine the circulation parameters from all individuals. As a result, a high rate of change was not observed in the circulation values of sedentary and futsal athletes. As a result of regular training, an increase in performance was observed on motoric characteristics. It can be concluded that individuals can improve their motoric features and increase their performance by doing sports.

Keywords: Training; Futsal; adaptation; sedentary.

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RESUMEN

El objetivo de este estudio es comparar los parámetros circulatorios y algunas adaptaciones motoras de deportistas de fútbol sala de 15 a 17 años e individuos sedentarios. Para ello se formó un grupo de deportistas y otro de sedentarios y se incluyeron en el estudio un total de 30 voluntarios. Las personas se incluyeron entre los atletas de fútbol sala y las personas que participaron en las audiciones de fútbol sala. Se registraron los valores de saturación, frecuencia cardíaca y presión arterial para examinar los parámetros de circulación de todos los individuos. Como resultado, no se observó una alta tasa de cambio en los valores de circulación de los atletas sedentarios y de fútbol sala. Como resultado del entrenamiento regular, se observó un aumento en el rendimiento de las características motoras. Se puede concluir que los individuos pueden mejorar sus características motrices y aumentar su rendimiento haciendo deporte.

Palabras clave: Entrenamiento; Fútbol Sala; adaptación; sedentarismo.

INTRODUCTION

Futsal is a team sport that includes intermittent and high-intensity physical activities played with unlimited substitutions in a narrow 20x40m field. The fact that the futsal ball has a less bouncing feature forces futsal players to improve their ability to play faster by keeping the ball in play all the time (Farhani et al., 2022). This situation requires players to have the ability to make quick decisions under pressure in attack and defense, to be more mobile and faster, and to change direction suddenly (Dogramaci et al., 2011). As in all fields in the world, rapid progress is taking place in the field of sports. For this reason, countries always aim for the best grade in the international sports competitions they participate in. Sports people know that in order to get the best results in sports competitions, it is necessary to follow the scientific and technological advances required by the period, as well as to include very long and tiring exercises. Countries are in constant struggle in both technological and sportive competitions (Yaman and Özpak, 2021).

High-intensity activities in offense and defense take place every 3.28 seconds (Dogramaci et al., 2011). Futsal players show a sprint performance at maximal speed every 79 seconds (Castagna et al., 2009; Castagna et al., 2006). During the match, sprint performances are performed by the players in different directions, at different distances (10-30m) and at different times (2-4 seconds). Futsal players need to perform short-term sprints with 20-30 second rest intervals in order to be successful in critical moments of the game (Alvarez et al., 2009). Therefore, in futsal, as in other team sports, it is very important for the athlete to run this distance more than once at maximum speed, rather than to cover a certain distance in the shortest time (Kinişler et al., 2011). Physical structure will be positively affected when combined with other performance variables such as strength, power, flexibility, speed, endurance. Thanks to the increase in intramuscular coordination resulting from high loading intensity, a rapid and significant increase in maximal strength can be achieved without a change in muscle mass or an increase in the athlete's weight. This is important in all sports where explosive force plays an important role (Nabo et al., 2021).

Based on the information explained above, it is aimed to compare the circulatory and some motoric characteristics of athletes who play futsal actively in sports clubs and sedentary individuals with non-athletes in the same age group and to examine their adaptations.

MATERIAL AND METHODS

Study Design

A total of 30 individuals between the ages of 15-17 participated in the study voluntarily. Subjects and their families were informed about the tests. Individuals participating in the research were selected among active futsal athletes (n:15). The sedentary group (n:15) was determined in the individuals who did not actively do sports and participated in the futsal auditions. The descriptive data of the individuals participating in the study are presented in tables. Circulation parameters and some motoric features of all individuals were measured and recorded. Horizontal jump test (Sahan, 2003), 20 meters speed test, vertical jump test (Pancar et al. 2018), 30 seconds push-ups, 30 seconds sit-up test (Klnç, 2008) was taken. Participants and their parents were informed about the study. Voluntary participation and parental consent were obtained. Necessary permissions were obtained from Gaziantep University Clinical Researches Local Ethics Committee for this study (2022/228).

Statistical Analysis

SPSS 21.0 statistical program was used in the analysis of the data obtained in the study. Descriptive statistics of the groups were made. Normality analysis of the data was performed. Independent Samples t-Test was used to evaluate two independent groups because of the normal distribution of the data. The obtained values are presented in tables.

RESULTS AND DISCUSSION

Statistical analyzis of the data belonging to the study are presented in tables. First, the descriptive data of the groups were included.

Table 1. Descriptive data of groups

VARIABLES	N	MIN.	MAX.	MEAN	STD. DEV
AGE (YEARS)	30	15.00	17.00	16.10	0.7119
HEIGHT (CM)	30	157.00	184.00	171.4	6.901
BODY WEIGHT (KG)	30	43.00	113.00	64.20	15.84

Descriptive statistics of the groups are presented in *Table 1.* Minimum age values are 15.00 and maximum values are 17.00 year. The minimum values for the height are 157.00 and the maximum values are 184.00 cm. The minimum values for body weight were recorded as 43.00 kg and the maximum values as 113.00 kg.

Table 2. Values analysis of circulation parameters of the groups

VARIABLES	GROUP	$\bar{X}$ ±STD.D	T	P
SPO2	Sedentary G	98.66±0.7237	0.000	1.00
	Futsal G.	98.66±0.48795		
PULSE	Sedentary G	92.73±12.93	0.828	0.426
	Futsal G.	88.93±12.820		
SYSTOLIC	Sedentary G	108.6±7.432	0.928	0.361
	Futsal G.	106.0±8.280		

VARIABLES	GROUP	X̄ ±STD.D	T	P
DIASTOLIC	Sedentary G	73.33±6.172	0.747	0.461
	Futsal G.	71.33±8.338		

Circulation parameters of sedentary and futsal athletes are presented in *Table 2*. There was no significant difference between the groups in terms of SpO2, pulse and blood pressure values ($p>0.05$). The heart rate and blood pressure values of the futsal athletes were found to be lower than those of the sedentary.

Table 3. Analysis of the values of selected motoric features of the groups

VARIABLES	GROUP	X̄ ±STD.D	T	*P*
VERTICAL JUMP	Sedentary G	27.53 ±6.045	-6.39	0.000
	Futsal G.	39.933 ±4.463		
HORIZANTAL JUMP	Sedentary G	148.4±22.54	-6.41	0.000
	Futsal G.	199.0±20.62		
SHUTTLE TEST	Sedentary G	13.80±3.255	-5.35	0.000
	Futsal G.	22.20±5.129		
PUSH-UP TEST	Sedentary G	11.00±6.187	-6.15	0.000
	Futsal G.	25.60±6.801		
SPEED TEST	Sedentary G	4.070±0.500	7.16	0.000
	Futsal G.	3.114±0.130		

Statistical analyzes of the motoric characteristics of the groups are presented in *Table 3*. Vertical jump, horizontal jump, sit-up, push-up and sprint values were statistically significant in favor of the futsal group at the $p<0.05$ level.

In this study, circulatory and motoric characteristics of futsal athletes and sedentary individuals were compared. According to the findings, no significant difference was found in the circulation parameters. When some selected motoric features were evaluated, it was found to be significant in favor of the athletes.

As the positive effects of regular training, it is aimed at increasing the diffusion capacity of oxygen. The most obvious effect of training is the increase in diffusion capacity in athletes. The diffusion capacity of oxygen is an indicator of the rate of diffusion of oxygen from the alveoli into the blood. Pulmonary and cardiovascular capacity can be increased with training (Astrand and Rodahl, 1986). In our study, it was determined that the circulation parameters of the futsal group changed compared to the sedentary groups. However, this change was not statistically significant. When the studies were examined, it was found that the resting heart rate values of the handball athletes decreased compared to the children who did not do sports (Kürkçü and Gökhan, 2011). It was also revealed by some researchers that the resting heart rate decreased with regular training. Again, in the studies conducted on athletes, it was stated that the heart rate was in the direction of decrease in groups doing sports. Researchers attribute the reason for this low heart rate to the increase in heart volume caused by long-term and hard training (Astrand and Rodahl, 1986).

Futsal branch consists of more intense struggle phases when compared to other sports. It is a sports branch that includes a lot of sprint runs (Alvarez et al., 2009). The fact that futsal is a high-intensity sport emerges when compared to other sports branches. It has been reported that the total distance of high-intensity running at maximum speed is greater than football, basketball, and handball (Bangsbo

et al., 2008; Bloomfield et al., 2007; McInnes et al., 1995; Alexander and Boreskie, 1989) . In situations that require high performance, the ability of the athlete to adapt to this situation physiologically and physically is considered as anaerobic power. In this process, the force exerted by the lower extremity, such as jumping vertically and horizontally, is the explosive force ability (Muratli et al., 2007).

In our study, a good level of significance was found in favor of the futsal group in terms of parameters such as vertical jump, standing long jump sit-ups and push-ups. When other studies were examined, it was stated that vertical jump and anaerobic power values were high (Bogdanis et al., 2007). We think that these high values may vary depending on age, athlete's year and professionalism. A football player or futsal athlete has to be fast while running, changing direction, attacking and defending throughout the match. Power is an important element, especially in sports that require speed and explosiveness (Farhani et al., 2022).

In our study, it was found that sprint performance, one of the motoric features, was higher in futsal athletes. We can say that this development has developed depending on the characteristics required by the sports branch. Futsal covers intense running areas and the development of this feature is considered important for combat. When the studies were examined, it was stated that the speed and agility training applied for eight weeks in football players affected the average speed positively (Yaman and Özpak, 2021). There are also studies showing that speed development is better in league players (Dunbar and Power, 1997). In a study on futsal players, the effect of futsal training on speed and anaerobic endurance was examined. It has been stated that there has been an improvement in the speed characteristics of the group that trains specific to football.

CONCLUSION

As a result, in this study, we can say that the motoric features of futsal athletes are at an improved level compared to sedentary individuals in the same age group. The motoric skills of children who are directed to training or sports at an early age will be at a good level, considering their developmental processes. In addition, the circulation parameters will adapt to the training and the oxygenation processes will improve.

REFERENCES

Alexander, M. J., & Boreskie, S. L. (1989). An analysis of fitness and time-motion characteristics of handball. *The American journal of sports medicine*, *17*(1), 76-82.

Astrand, P. O., & Rodolh, K. (1986). Texbook of Work Physiology 3. England.

Alvarez, J. C. B., D'ottavio, S., Vera, J. G., & Castagna, C. (2009). Aerobic fitness in futsal players of different competitive level. *The Journal of Strength & Conditioning Research*, *23*(7), 2163-2166.

Bangsbo, J., Iaia, F. M., & Krustrup, P. (2008). The Yo-Yo intermittent recovery test. *Sports medicine*, *38*(1), 37-51.

Bloomfield, J., Polman, R., O'DONOGHUE, P. E. T. E. R., & McNaughton, L. A. R. S. (2007). Effective speed and agility conditioning methodology for random intermittent dynamic type sports. *The Journal of Strength & Conditioning Research*, *21*(4), 1093-1100.

Bogdanis, G. C., Papaspyrou, A., Souglis, A., Theos, A., Sotiropoulos, A., & Maridaki, M. (2009). Effects of hypertrophy and a maximal strength training programme on speed, force and power of soccer players. In *Science and Football VI. The proceedings of the sixth world congress on science and football* (pp. 290-295). Routledge, New York.

Castagna, C., Impellizzeri, F. M., Chamari, K., Carlomagno, D., & Rampinini, E. (2006). Aerobic fitness

and yo-yo continuous and intermittent tests performances in soccer players: acorrelation study. *The Journal of Strength & Conditioning Research*, *20*(2), 320-325.

Castagna, C., D'Ottavio, S., Vera, J.G., Álvarez, J.C.B. (2009). Match demands of professional Futsal: a case study. Journal of Science and Medicine in Sport, 12(4), 490-494.

Croxall, J.P., Steele, W.K. , Mcınnes, S.J., & Prınce, P.A. 1995. Breedıng Dıstrıbutıon Of The Snow Petrel Pagodroma Nıvea. Marine Ornithology 23: 69-100.

Dogramaci, S. N., Watsford, M. L., & Murphy, A. J. (2011). Time-motion analysis of international and national level futsal. *The Journal of Strength & Conditioning Research*, *25*(3), 646-651.

Dunbar, G., & Power, K. (1997). Fitness profiles of English professional and semi-professional soccer players using a battery of field tests. *Science and football III*, 27-31.

Farhani, F., Arazi, H., Mirzaei, M., Nobari, H., Mainer-Pardos, E., Chamari, I. M., ... & Chamari, K. (2022). Associations between bio-motor ability, endocrine markers and hand-specific anthropometrics in elite female futsal players: a pilot study. *BMC Sports Science, Medicine and Rehabilitation*, *14*(1), 1-8.

Kayantaş, İ., & Söyler, M. (2020). The effect of narrow field trainings on some physical parameters in regional amateur league footballers. [Dar Alan Antrenmanlarının Bölgesel Amatör Lig Futbolcularında Bazı Fiziksel Parametreler Üzerindeki Etkisi]. *Herkes için Spor ve Rekreasyon Dergisi*, *2*(2), 81-88. (In Turkish)

Klnç, F. (2008). An intensive combined training program modulates physical, physiological, biomotoric, and technical parameters in women basketball players. *The Journal of Strength & Conditioning Research*, *22*(6), 1769-1778.

Kinişler, A., Yilmaz, A., Turgut, B., & Aşici, C. (2011). The effect of sexual maturation on repeated sprint ability in children. [Çocuklarda cinsel olgunlaşmanin tekrarli sprint yeteneğine etkisi]. *Spor Bilimleri Dergisi*, *22*(1), 25-31. (In Turkish)

Kürkçü, R., & Gökhan, İ. (2011). The effects of handball training on some respiratory and circulatory parameters of students aged 10-13. [Hentbol antrenmanlarının 10-13 yaş grubu öğrencilerin bazı solunum ve dolaşım parametreleri üzerine etkileri]. *Uluslararası İnsan Bilimleri Dergisi*, *8*(1), 135-143. (In Turkish)

Muratli, S., Kalyoncu, O., & Sahin, G. (2007). Antrenman ve Musabaka, Ladin Matbaasi, 2. *Baski, İstanbul*. (In Turkish).

Nabo, J., Conceição, A., Parraca, J. A., Tomas-Carus, P., & Batalha, N. (2021). Comparison of cardiorespiratory resistance in different menstrual cycle phases in female futsal players. *Apunts Sports Medicine*, *56*(209), 100341.

Pancar, Z., Biçer, M., & Özdal, M. (2018). The effect of 8-week plyometric training applied to 12-14 age group female handball players on some selected strength parameters . [12–14 yaş grubu bayan hentbolculara uygulanan 8 haftalik pliometrik antrenmanlarin seçilmiş bazi kuvvet parametrelerine etkisi]. *Spor ve Performans Araştırmaları Dergisi*, *9*(1), 18-24. (In Turkish)

Sahan, A. (2003). Investigation of Factors Affecting the Development of Tennis Skills in Seventeen to Twenty-Four Age Young People (Doctoral dissertation, M.Sc. Thesis, Antalya). [*On yedile Yirmi dört Yas Gençlerde Tenis Becerisinin Gelişimine Etki Eden Faktörlerin Araştırılması* (Doctoral dissertation, Yüksek Lisans Tezi, Antalya)]. (In Turkish)

Yaman, I., & Özpak, N. (2021). The effect of speed and agility training applied in football players on some performance parameters. [Futbolcularda uygulanan sürat ve çeviklik antrenmanlarının bazı performans parametrelerine etkisi]. *Akdeniz Spor Bilimleri Dergisi*, *4*(1), 1-10. (In Turkish)