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Examination of Some Respiratory Functions, and Physical and Motor Skills of Male Athletes in the High School Team

Lise Takımlarında Oynayan Erkek Sporcuların Bazı Solunum Fonksiyonları, Fiziksel ve Motor Becerilerinin İncelenmesi

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EXAMINATION OF SOME RESPIRATORY FUNCTIONS, AND PHYSICAL AND MOTOR SKILLS OF MALE ATHLETES ON THE HIGH SCHOOL TEAMS

ABSTRACT

The purpose of this study is to investigate the effect of sports on some motoric, physical, and lung functions of athletes and sedentary individuals in the same age group with young individuals playing in high school teams in different sports branches. A total of 60 volunteer individuals, including 45 athletes (15 male basketball players, 15 male handball players, 15 male football players), and 15 male sedentary individuals participated in the study. FVC (l), FEV1 (l), PEF (l/s), FEF 25/75 (l/s) and MVV (l/min) values were not statistically different between the branches (p>0.05). FEV1 / FVC % values differed between branches (p<0.05). FEV1 / FVC % values differed between branches (p<0.05). There was no statistical difference between branches in 30 m speed values (p>0.05). 30 m durability at velocity values were found to be different between branches (p<0.05). There was no statistical difference between the branches according to their mean grip strength values (p>0.05). In our study, athletes who played in high school teams had better lung function than those who did not play sports with the same physical characteristics and when FEV1/FVC ratios were evaluated, the risk of developing obstructive and restrictive lung diseases was lower.

Keywords: Agility, Durability At Velocity, Grip Strength, Lung Capacity, Speed.

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LİSE TAKIMLARINDA OYNAYAN ERKEK SPORCULARIN BAZI SOLUNUM FONKSİYONLARI, FİZİKSEL VE MOTOR BECERİLERİNİN İNCELENMESİ

ÖZ

Çalışmanın amacı lise takımlarında farklı spor branşlarında oynayan genç erkek bireylerle aynı yaş grubundaki sedanterler **üze**rinde spor yapmanın ve spor türünün bazı motorik, fiziksel ve akciğer fonksiyonları **üzerine** etkilerinin incelenmesidir. Lise okul takımlarında yer alan 45 sporcu (15 basketbol, 15 hentbol, 15 futbol) ve 15 sedanter olmak üzere toplam 60 erkek gönüllü çalışmaya katılmıştır. FVC (l), FEV1 (l), PEF (l/s), FEF 25/75 (l/s) ve MVV (l/dk) değerlerinde branşlar arasında istatistiksel olarak fark tespit edilmemiştir (p>0,05). FEV1/FVC% değerlerinde ise branşlar arasında fark tespit edilmiştir (p<0,05). 30 m sürat değerlerinde branşlar arasında istatistiksel olarak fark tespit edilmemiştir (p>0,05). 30 m

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süratte devamlılık değerlerinde ise branşlar arasında fark tespit edilmiştir (p<0,05). Branşlar arasında kavrama kuvveti değerleri ortalamalarına göre istatistiksel olarak fark tespit edilmemiştir (p>0,05). Çalışmamızda lise çağındaki okul takımlarında oynayan sporcuların benzer fiziksel özelliklere sahip spor yapmayan bireylere göre daha iyi akciğer fonksiyonlarına sahip olduğu görülmüştür. FEV1/FVC oranları değerlendirildiğinde bu durumun obstrüktif ve restriktif akciğer hastalıklarına yakalanma risklerinin düşük olabileceği düşünülmektedir.

Anahtar Kelimeler: Akciğer Kapasitesi, Çeviklik, Kavrama Kuvveti, Sürat, Süratte Devamlılık.

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INTRODUCTION

Beneficial working capacity is a prerequisite for high athletic performance and is evaluated based on the functionality of energy systems in sports applications (Zenić et al., 2013). Energy systems are closely related to oxygen uptake and metabolism in the lungs, which are recycled with respiration. Breathing is a complex process that involves ventilation, which rhythmically and continuously regenerates the air in the lungs, oxygen, and carbon dioxide diffusion from the alveolar membrane, and its flow through the lung capillaries (Guyton, 1985). Pulmonary ventilation function, which shows the respiratory inlet and outlet, that is the movement of air between the atmosphere and the lung alveoli, is tested by the spirometer method, which measures static volumes and capacities and dynamic lung volumes. A spirometer is a rattling acceptable diagnostic method in sports due to its simple application. The two tests most used to describe the ventilation function of the lungs in athletes and the general populations are mandatory vital capacity and maximum voluntary ventilation (Guyton, 1985).

Pulmonary ventilation represents a measure of the athlete's health status, which determines the quality, optimal, and likelihood of successful training. Although it is generally noted that lung volume and capacities vary insignificantly under the influence of training, that is, vital capacity increases slightly, but total lung capacity does not, different sports have different effects on the development of respiration (Willmore, 1990). Prakash et al., (2007) reported that people who adapted major to physical exertion with systematic exercise noticed more efficient ventilation. However, aerobic stimuli have the greatest effect on increasing vital capacity, while anaerobic stimuli have the greatest effect on increasing air flow velocity. A pulmonary function test is an important diagnostic procedure in sports. This lack of relevant literature can be explained by the common belief that respiratory analysis in sports is not so important, further explained by the presence of large capacities in athletes and its small effect on oxygen consumption (Jelicic, 2000). Along with regular training for athletes, motor characteristics and respiratory functions are consequential. While the athletes who train regularly and in a planned way develop motoric features, they also develop physiological features. The cardiovascular system is very developed in athletes.

This can be explained by the development of heart and respiratory functions. During exercise, ventilation accelerates, so the oxygen intake capacity and the endurance capacity are increased by carrying to greater extent oxygen with the blood to the tissues (Jelicic, 2000). Although the respiratory volume does not interchange much with rest and submaximal exercises in athletes with regular training, a significant increase is observed in maximal exercise (Günay et al., 2017).

Sports are considered a part of a healthy and balanced life and one of the beneficial social activities in our life (Kürkçü and Gökhan, 2011). Especially planned sports activities in childhood play a meaningful role in the development and maintenance of a healthy physical metabolism. The planned sports activities of the child before and after adolescence ensure a healthier circulation and respiratory system while contributing to the mental and spiritual development in another aspect (Alpay et al., 2007).

Polvan, called adolescence physically, mentally, and socially the variety of individuals from childhood to become an adult. Parman says the following: adolescence is called evolution because of some changes shown by individuals and uses the diagnosis of rebirth, influenced by the thoughts of French psychiatrist Françoise Dolto (Parman, 1998). The birth of the fetus as a baby in the mother's womb was expressed as birth, and the change of children into an adult individual was expressed as adolescence. Dolto is like adolescents to lobsters that are sensitive and weak at molting time, just like babies, because they are emotionally weak and sensitive. If an individual receives any physical or emotional impact during adolescence, they cannot get rid of it for a long time. Adolescence, which is a weak and vulnerable period for the individual, contains many threats (Polvan, 2000).

On the other hand, sport is an activity that complements, influences, and directs people's lifestyles considering the results of various studies, the social and creative aspects of people who are active increase, it is observed that these people enjoy their work more. In addition, the recent sports-related publications of the media play a role in encouraging children and young people to sports. Therefore, one of the activities that should be emphasized today is to increase the physical activities of children and young people, carrying out activities that contribute to sportive performance levels. With the work to be done in this direction, it will be ensured that society will be raised as healthier individuals (Çeker et al., 2013).

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Physical and motor characteristics of basketball, handball, and football such as endurance, speed, strength, skill, and mobility, aim to take it to the next level with planned studies starting from the development age (Ceylan et al., 2016) and when it reaches adulthood, it brings it to an efficient, superior level. It is aimed to strengthen the organism with regular training, improve body posture, and have a solid organism (Akçakaya, 2009).

This study aims to determine the physical, motoric features, and respiratory functions of male athletes who regularly train in high school teams and play in basketball, handball, and football teams, and sedentary male individuals who do not do sports regularly and to compare the groups in terms of these parameters.

MATERIAL AND METHODS

Subjects

45 athletes aged 15-18 (15 basketball, 15 handball, 15 football) who took part in the school teams of Ordu Cumhuriyet Anadolu High School also participated in a total of 60 male volunteer studies, including 15 sedentary ones. All participants completed a health screening questionnaire and signed an informed consent form. The study was initiated after the approval of the Ordu University Health Research Ethics Board (2020-03).

Assessments

Respiratory capacity measurements:

Measurements of respiratory parameters were made with the Cosmed Spiropalm 6MWT spirometer device. Measurements were repeated 2 times with a decal of 5 minutes in the sitting position and the best ratings of the individuals were recorded. Forced vital capacity and maximum voluntary ventilation measurements were made. Along with these measurements, other respiratory values mentioned below were also recorded.

Forced Vital Capacity (FVC): It is the maximum air volume that is expelled with forced, fast, and deep expiration after deep inspiration. In addition, the expected FVC% has been recorded. In healthy people, FVC = VC. FVC <VC in obstructive diseases.

1 st Second Forced Expiratory Volume (FEV1): It is the volume thrown in the first second of forced expiration. In addition, the expected 1st second forced expiratory volume percentage (FEV1%) was recorded.

FEV1/FVC%: It is important in determining the type of respiratory disorder (obstructive or restrictive). If FVC and FEV1 values are low, this ratio is normal or higher than the expected value for a restrictive disorder, lower than expected value indicates obstructive disorder. Restrictive pulmonary disease is a clinical picture characterized by respiratory restriction, exertional difficulty breathing (effort dyspnea), and decreased lung vital capacity. In all restrictive (restrictive, obstructive) diseases, there is a decrease in the functions of the affected system. Chronic Obstructive Pulmonary Disease (COPD) is characterized by permanent narrowing of the respiratory airways. This disease causes more effort in breathing and breathing obstruction. The most common symptoms are shortness of breath, cough, and sputum. Symptoms are more severe when physical activity is done. In very severe COPD causes, shortness of breath is felt even at rest (Atasever and Erdinç,2003).

Maximum Voluntary Ventilation (MVV): It is the maximum volume that can be inhaled in one minute with a maximum voluntary effort. This measurement was carried out by individuals making MVV for 12 seconds.

FEF 25-75% (L/s): Forced is the mid-expiratory flow volume. It is the flow velocity between the first and last of the forced expiration. (In other words, the current speed is measured when the 50% volume is ejected after the first 25% of the air is ejected). It is the part of forced expiration that is not dependent on performance. Shows obstruction in the airways at an early stage. While FEV1 is normal, FEF25-75 below the predicted value indicates obstruction in small airways.

Peak Expiratory Flow (PEF): Evaluated in rapid expiration after maximal inspiration. 1-2 seconds of effort is sufficient. Long waiting during maximal inspiration reduces PEF value.

Hand Grip Strength:

Hand grip strength was measured in a standing upright position using a hand dynamometer at an angle of approximately 45 degrees between the arm and the body. Measurements were made on the dominant arm. Takei Grıp-D TKK 5401 brand hand dynamometer was used in the measurements. Everyone participating in the measurement had 3 trials and the best grade was recorded in kg.

30-Meter Sprint Test:

The volunteers ran the predetermined distance of 30 meters at their highest speed. They started the run by putting one foot on the starting point 1 meter behind the photocell and finished the run by passing through the photocell at the end

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of the track. The best score of three attempts is recorded in seconds. A Microgate brand photocell device with 0.01 sensitivity was used in the measurements.

Durability at 30 Meters Velocity:

The volunteers ran 30 meters at their highest speed without stepping on the starting line. After the end of the 30-meter distance, it was run five times in the same way by turning back with a jog. The arithmetic mean of the results was evaluated in seconds. A Microgate brand photocell device with 0.01 sensitivity was used in the measurements.

Illinois Agility Test:

The test track, consisting of three cones lined up on a straight line with a width of 5 m, a length of 10 m, and 3.3 m intervals in the middle, was established. The test consists of a 40 m straight, and 20 m slalom run between cones, with 180 ° turns every 10 m. After the test track was prepared, a two-door photocell electronic stopwatch (Micragate Brand Electronic Photocell) system was installed at the beginning and end of the test with an accuracy of 0.01 seconds. Before the test, after the introduction of the course and the necessary explanations, the volunteers were allowed to do 1-2 trials at a low pace, and then the volunteers were given 5-6 minutes of warm-up and stretching exercises at a low pace they determined. Volunteers were taken from the starting line of the test track in the prone position and with their hands in contact with the ground at shoulder level. The time to finish the track after passing through the finish photocell was recorded in seconds.

Statistical Analyses

In this study, all statistical calculations were made in SPSS 22.0 V statistical package program. Descriptive statistical methods such as arithmetic mean (X) and standard deviation (SD) were used in the statistical evaluation of the data obtained. One-way analysis of variance was used to examine the interdisciplinary variables, and independent groups t-test was used to determine the differences between athletes and sedentary groups. The results were evaluated at a significance level of $p < 0.05$.

RESULTS

Table 1. Physical Characteristics of Volunteers Participating in the Study

Variable	Group	n	Mean	sd	F	p
Age (year)	Basketball	15	17.00	0.92	1.235	0.306
	Football	15	16.80	1.08		
	Handball	15	16.80	1.08		
	Sedentary	15	17.40	0.82		
Length (cm)	Basketball	15	176.66	0.11	0.746	0.529
	Football	15	176.47	0.04		
	Handball	15	180.33	0.09		
	Sedentary	15	176.13	0.08		
Weight (kg)	Basketball	15	68.66	14.05	0.985	0.406
	Football	15	66.26	5.47		
	Handball	15	73.26	13.15		
	Sedentary	15	68.60	11.09		
BMI (kg/m^2)	Basketball	15	21.85	2.97	0.539	0.658
	Football	15	21.26	1.25		
	Handball	15	22.48	3.19		
	Sedentary	15	22.10	2.93		

There was no statistically significant difference in age (year), height (cm), weight (kg), and BMI (kg / m2) values of the individuals participating in the study ($p>0.05$). This result showed that the individuals participating in the study had similar physical properties.

Table 2. Comparison of respiratory values of all participants

Variable	Group	n	Mean	sd	F	p
FVC (lt)	Basketball	15	4.58	1.03	0.108	0.955
	Football	15	4.75	0.85		
	Handball	15	4.64	0.75		
	Sedentary	15	4.70	0.90		
FEV1 (lt)	Basketball	15	4.30	0.95	0.575	0.634
	Football	15	4.57	0.79		
	Handball	15	4.26	0.61		
	Sedentary	15	4.20	0.90		
FEV1/FVC %	Basketball	15	94.36	4.84	4.922	0.004*
	Football	15	96.65	3.38		
	Handball	15	92.55	5.84		
	Sedentary	15	88.17	9.38		
PEF (lt/s)	Basketball	15	7.44	1.69	2.122	0.108
	Football	15	6.81	1.38		
	Handball	15	6.74	1.60		
	Sedentary	15	5.94	1.83		
FEF 25/75 (lt/s)	Basketball	15	4.81	1.12	1.947	0.133
	Football	15	5.57	0.98		
	Handball	15	4.91	0.92		
	Sedentary	15	4.70	1.27		
MVV (lt/dk)	Basketball	15	153.22	35.97	1.263	0.296
	Football	15	175.13	24.93		
	Handball	15	158.78	39.94		
	Sedentary	15	155.23	34.67		

*p<0.05

When the respiratory values of the individuals participating in the study are examined; There was no statistically significant difference between the branches in terms of FVC (lt), FEV1 (lt), PEF (lt / s), FEF 25/75 (lt / s) and MVV (lt / min) (p> 0.05). FEV1 / FVC % values showed a difference between branches (p<0.05). According to the post hoc test conducted to determine the difference between the branches, this difference is that individuals who play basketball (p=0.044) and football (p=0.003) have higher average FEV1/FVC % values than sedentary individuals. Although the mean FEV1 / FVC% values of the players playing in handball teams were found to be higher than sedentary individuals, this difference was not statistically significant.

Table 3. Comparison of all participant' sprint and durability velocity values.

Variable	Group	n	Mean	sd	F	p
30 m Sprint (s)	Basketball	15	4.54	0.87	1.857	0.147
	Football	15	4.29	0.16		
	Handball	15	4.60	0.43		
	Sedentary	15	4.63	0.48		
30 m Durability Velocity (s)	Basketball	15	4.60	0.30	3.527	0.021*
	Football	15	4.36	0.16		
	Handball	15	4.69	0.43		
	Sedentary	15	4.78	0.48		

*p<0.05

When the velocity and velocity durability values of the individuals participating in the study are examined; There was no statistically significant difference between the branches at 30 m speed values (p> 0.05). There was a difference between the branches in the durability values at 30 m speed (p <0.05). According to the post hoc test made to determine the difference between the branches, this difference is It is between individuals playing in football teams and sedentary individuals. The durability velocity levels of the individuals in football teams at 30 m were found to be better than the sedentary individuals (p = 0.016). There was no statistically significant difference between sedentary individuals and the players who played in basketball and handball teams (p> 0.05).

Table 4. Comparison of illinois agility test values of all participants

Variable	Group	n	Mean	sd	F	p
Illinois Test (s)	Basketball	15	17.21	0.85	7.298	<0.001
	Football	15	16.42	0.24		
	Handball	15	17.41	0.90		
	Sedentary	15	17.75	1.00		

When the agility values of the individuals participating in the study the Illinois test results were examined; a statistical difference was found between all branches according to the Illinois test average values (p <0.05). According to the post hoc test made to determine the difference between the branches, this difference in Illinois agility values of individuals playing in football teams was found to be better than those who played in sedentary (p<0.001), basketball (p = 0.047) and handball (p = 0.008) teams.

Table 5. Comparison of the grip strength values of all participants.

Variable	Group	n	Mean	sd	F	p
Grip Strength (kg)	Basketball	15	37.80	6.99	1.991	0.126
	Football	15	43.03	4.11		
	Handball	15	42.89	8.19		
	Sedentary	15	40.71	6.87		

When the grip strength test values of the individuals participating in the study were examined; there was no statistically significant difference between the branches according to the average strength values. (p>0.05).

DISCUSSION

Our study aimed to compare some physical and anthropometric characteristics and selected respiratory parameters of male individuals aged between 15-18 who played basketball, handball, and football in high school teams and sedentary male individuals.

They reported the average height of 30-star basketball players in the infrastructure of the Fenerbahçe basketball team as 187.89 ± 0.04 cm, and the average body weight as 79.66 ± 8.73 kg (Savucu et al., 2004). Kuter and Öztürk (1992) determined the average height of 13 young basketball players as 181.62 ± 6.74 cm and the average body weight as 69.93 ± 6.37 kg. Temoçin and Tekin (2004) reported the average height of 66 young football players from the infrastructure of Aydınspor, Aydın Tekstilspor, and Aydın Belediyespor as 177.78 ± 6.96 cm, and the average body weight as 66.87 ± 6.73 kg. In another study conducted among young athletes in which physical fitness parameters were examined, the average height of handball players was 184 cm, body weight 77.1 kg, and body mass index 21.9 kg / m^2 (Eler, 2018).

In Parlak's (2018) study, the average age, weight, height, and body mass index of handball and basketball players were calculated statistically, the weight variables of the basketball players were 67.68 ± 14.5 kg handball players 69.59 ± 12.98 kg, and the height variations of the basketball players was 1.77 ±6,96 cm It was found that the mean body mass index of 0.08 cm, the height of the handball players was 1.76 ± 0.0 cm and the average body mass index of the basketball players was 21.19 ± 3.07 kg / m^2. The mean body mass index of the handball players was 22.33 ± 3.16 kg / m^2. When these parameters were compared between the two branches, no significant difference was found. In our study, the average height, body weight, and body mass index were 176.66 cm, 68.66 kg, and 21.85 kg / m^2 for basketball players, 176.47 cm, 66.26 kg, and 21.26 kg / m^2 for football players, 180.33 cm, 73.26 kg ve 22.48 kg/m^2 for handball players. In sedentary individuals 176.13 cm, 68.60 kg and 22.10 kg / m^2. When the data we have found are compared with the literature, they are like the results obtained in our study.

Yörükoğlu and Koz (2007) reported the average of 8 young basketball players from the Ankara University Sports Club infrastructure as 4.81 ± 1.36 seconds. In another study, it was determined that the 30 m speed average of 60 basketball players aged 13-16 was 4.77 ± 0.24 seconds (Bayramoğlu, 1998). Temocin and Tekin (2004), Aydınspor, Aydın Tekstilspor, and Aydın Belediyespor determined the 30 m sprint value of 66 young players from the infrastructure as 4.26±0.21 seconds. Kürkçü et al., (2009) reported a 30 m sprint average of 4.15±0.52 seconds for 18 young football players in their study. In the study conducted by Atlı (2009), the average of the 30 m speed test was found to be 4.88 ± 0.26 seconds in basketball players and 4.58 ± 0.06 seconds in sedentary players. Koç et al., (2011), determined the average speed of handball players as 4.65 ± 0.48 s and the average speed of basketball players as 5.20 ± 0.77 s in their study.

In a study where some physical parameters and 30-meter sprinting ability of professional football players playing in different positions were examined, the average 30-meter sprint value of goalkeepers was 4.31 ± 0.14 s, and the average 30-meter sprint value of defenders was 4.21 ± 0.24 s, midfield The average 30-meter sprint values of the players were found to be 4.22 ± 0.20 s and the average 30-meter sprint values of the strikers were found to be 4.22 ± 0.17 s. There is no statistically significant difference between the groups involved in the study (goalkeepers, defenders, midfielders, and forwards) in terms of 30-meter sprint values

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(Taşkın, 2006). In another study, the average 30-meter sprint measurement values of professional football players were found to be 4.28 ± 0.16 s (Kızılet et al., 2004). In a study conducted by Hazır et al., (2010), they could not find a significant difference between the 10 m and 30 m sprint values of the football players playing in the Turkish Super League, according to their positions. In our study, the average 30 m sprint and durability velocity was respectively 4.74 s and 4.60 s for basketball players, 4.29 s and 4.36 s for football players, 4.60 s and 4.69 s for handball players, 4.63 s and 4 s for sedentary players. When the sprint values between the groups are compared, they are the football players with the best 30-meter sprint value, but no statistically significant difference was found. When the durability values in velocity were compared, a significant difference was found between the players in favor of the players. Velocity improvement can be achieved by improving coordination, movement efficiency, and timing. Considering the characteristics of the game of football, the advantage of a very little time advantage such as 0.03 s during the sprint time of the player with a better sprint feature is very important in terms of reaching the ball earlier and ahead in terms of distance (Eniseler et al., 1996). Players serving in the defensive, midfielder, and attacking zone within 90 minutes in football; 100 times in 10-20 meters slow jogging, 50 times in 10-20 meters fast jogging, and 40 times in 9-10m sprints (Gündüz, 1997). Therefore, effective speed property is an important motoric property for best performance in football.

Basketball is also an important property that speed skills should be for a good performance. However, it is thought that height and body weight may negatively affect the speed and agility characteristics, and therefore the speed property is significantly lower in favor of football players.

In a study, it was found that English Premier League professional players made 609 turns within 0-90 degrees in a right-left direction in a match, and 95 turns above 90 degrees (Bloomfield et al., 2007). In another study, it was found that futsal players make a locomotor movement change every 3.3 seconds in a match (Doğramacı and Watsford, 2006). Therefore, to develop the ability to change direction at the highest level, athletes are required to study the movements they do in practice in a planned manner in training (Bompa and Haff, 2017).

In the study conducted between 20-year-old indoor football and football players, it was determined that the difference between the agility test grades is important (Başkaya et al., 2018). In another study in which 66 futsal and football players were included in Italy, futsal players showed better performance than football players because of agility tests (Benvenuti et al., 2010). Agility performance increases with age, it is further improved with repetitions and training. In addition to being an important physical component for successful performance in football, as in many sports branches, agility ability is reported to be the most basic performance component that determines the quality of a football player's high-speed directional running, sudden acceleration, and stopping (Hazır et al., 2010).

In our study, the Illinois agility test averages were found as 17.21 s for basketball, 16.42 s for football, 17.41 s for handball, and 17.75 s for sedentary. When the data were analyzed, statistically significant differences were found between the individuals who play football and the individuals who play handball, basketball, and sedentary individuals. When the data and literature are compared, it is seen that they have similar results in agility performance in team sports. It is known that football players have superior agility performance compared to players who play team sports in other branches.

Erol and Sevim (1993) found that the average right-hand grip strength of amateur basketball players was 47.32kg ± 7.47, and the mean value of left-hand grip strength was 44.79kg ± 7.96. These values were found close to the values in our study. There is no statistically significant difference between the averages when the right-hand grip strength values of offensive and defensive players are examined. Kartal and Günay (1994) measured the average hand strength of football players as 54.43 kg in their studies on amateur football players. In his doctoral dissertation, Yamaner (1990) measured the hand grip strength of professional football players from Galatasaray as 42.9 kg. Kuru and Savas (2006), in their research called Investigation of some physical and physiological parameters of professional male basketball players before the preparation period of the athlete group, averages of right-hand grip strength; 42.66kg ± 6.19, after the preparation period 46.25kg ± 5.56, left-hand grip strength; it was found as 42.00 kg ± 4.55 after 39.33 kg ± 5.53 preparation period. These values are seen as close to the values we find. Yolcu (2012) researched the average right-hand grip strength of the subjects; 38.035kg ± 8.252 for basketball players and he found 34.983kg ± 6.587 when looking at the average left grip strength. Looking at the average age of the study here (14-17 years), it is seen that there is a high similarity between our study and other studies.

In our study, the grip strength values between the groups were found as 37.80 kg for basketball, 43.03 kg for football, 42.89 kg for handball, and 40.71 kg for sedentary individuals, respectively. In the light of the data found, when the literature on grip strength is scanned, we see that there are similar results, and data supporting our study are obtained.

In this study we have done, that the individuals who play on basketball and football teams have higher FEV1 / FVC% values compared to sedentary individuals and there is a statistically significant difference. Although the mean FEV1 / FVC% values of the players playing in handball teams were found to be higher than sedentary individuals, this difference was not statistically significant. It is known that exercises with a dominant aerobic character have a positive effect on vital capacity, whereas exercises with an anaerobic character contribute to the improvement of dynamic ventilation parameters. Basketball, handball, and football are primarily characterized by their anaerobic lactate character. Short distance explosive runs last an average of 7 seconds and pauses last an average of 14 seconds between two points. Examples include actions during jumps, accelerations, rapid changes of direction, and descents. Therefore, more successful players are faster and more explosive than less successful players and are also characterized by good jump endurance (Lidorand Ziv, 2010; Borras et al., 2011; Milic et al., 2013). It can be assumed that this structure of motor and functional abilities in more successful team players is partly due to the superior results in dynamic breathing capacity compared to less successful players. Respiratory function changes significantly with age. Minute ventilation increases with age to the point of physical maturity and decreases with age. These changes are related to the enlargement of the entire pulmonary system. Lung mass almost triples from when a child enters kindergarten to puberty. During this time, vital capacity increases from about 1000 ml to 3000 ml, and the total lung capacity increases from 1400 ml to 4500 ml. The structure of the lungs is not fully developed at birth and the number of alveoli and airways increases approximately 10 times before the child reaches maturity. In late childhood and adolescence, these changes mostly occur with the enlargement of existing alveoli and airways. However, the effect of training on the respiratory system is significant. Exercises that require a large amount of breathing stimulate the growth and development of the thorax in young athletes, thus achieving a wider, longer, and greater capacity. In a larger thorax, called" spore lungs", the surface of the lung alveoli develops significantly, with a greater volume of air, but also blood volume. Also, increasing training strength leads to hypertrophy of respiratory muscles and more economical breathing with lower frequency (Lakhera et al., 1994; Jelicic, 2000; Hraste, 2004).

There was no statistically significant difference between the branches in terms of FVC (lt), FEV1 (lt), PEF (lt / s), FEF 25/75 (lt / s), and MVV (lt / min) when the respiratory values of the individuals participating in our study are examined; When the literature is reviewed, running training was applied to girls in the 10-14 age group, five times a week, for a year, and as a result, the FVC value was recorded as 2.35 lt (Van Zant and Kuzma, 1993). This value is considerably lower than the FVC value (3.72 lt) obtained from girls in this study. It has been reported that physiological development may be more effective on respiratory parameters in children, and exercise may not have much effect on respiratory parameters (Sarı et al., 1981; Ergen, 1983). Moğulkoç et al., (1997), in their study, the FEV1 value of the control group was recorded as 86.26±4.20 lt, 86.56±4.21 lot of the athletics group, 88.29±3.90 lt of the basketball group, and no significant differences were found between the groups. Similarly, FVC, FEV1, PEF, and FEV1 / FVC values were compared between groups of athletes training in different sports branches, and no significant difference was found between the groups (Triki et al., 2013). This study shows that 15-18 age group male students in high school teams who train in different sports branches have higher FVC, FEV1, PEF, FEF25-75, and MVV values than sedentary students of the same age group. It is thought that this difference can be explained by the effect of training, as well as by the increase in respiratory capacity in parallel with physical development (increase in height and body weight). In our study, there is a significant relationship between the FEV1 / FVC% values of young basketball players and football players compared to sedentary ones. However, when the averages of other respiratory parameters are examined, it is seen that it is significantly higher, although not statistically significant. According to these findings, it is stated that athletes who play in high school age school teams have better lung functions compared to individuals who do not do sports with the same physical characteristics, and when FEV1 / FVC ratios are evaluated, it is thought that the risk of developing obstructive and restrictive lung diseases is low. We see that many studies in the literature also support our findings. There is a consensus that the lungs and respiratory capacity that make up the respiratory system develop in proportion to age, height, weight, and body ratio (Sevim, 1997).

CONCLUSION AND RECOMMENDATIONS

In our study, differences were determined in some motoric, physical, and selected respiratory parameters of male individuals playing in school teams in different branches at the high school level.

When the physical parameters of the individuals participating in the study were examined, no difference was found. This result showed that the individuals participating in the study had similar physical characteristics. When looking at the data obtained because of the sprint measurement, no significant difference was found between the groups. However, when the durability at velocity was examined, it was determined that the individuals playing football were better than the sedentary individuals and there was a statistically significant difference. This result shows that young individuals who play sports, especially football, can develop some of their motoric characteristics with branch-specific training.

Football and basketball are dynamic sports that use both aerobic and anaerobic systems, played for long periods, short sprints, and rest intervals that require intense effort. Players spend more time in the game and travel a very long distance during the match, and it can increase pulmonary capacities as it is generally accepted that regular exercise has a positive effect on the lung. In addition; longer oxygen transport and a significant improvement in the utilization system in training and playing. Therefore, people with higher physical activity are expected to have higher fitness levels because physical activity improves cardiovascular fitness.

The importance of this study is to ensure that expert sportsmen and trainers include physiological processes of respiration and motoric features in their training plans and contribute to the literature. It is recommended that young athletes contribute to their development through training programs that will be developed, while individuals who do not play sports are directed according to their abilities and physical characteristics.

The quality of the training, body types, lung capacities, and motor characteristics of young male athletes in different sports branches, especially in their growing up and adolescence, are interrelated with each other. In our study, it was aimed to maximize the performance of athletes in different branches in these periods when they were the best in terms of breathing and physical fitness, depending on the nature of the sport type. In addition, by examining the relationship between some respiratory parameters, motor, and anthropometric characteristics of athletes, in the light of the data obtained, the risks of injury and long-term disability will be minimized and will contribute positively to training programs.

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Conflict of interest

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Author Contribution Rates:

Design of Study: CK (%50), HS (%50)

Data Acquisition: CK (%100)

Data Analysis: HS (%100)

Writing Up: CK (%50), HS (%50)

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