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Relationship Between Body Composition, Multiple Repeated Sprint Ability and Vertical Jump Performance in Elite Badminton Players

Relación entre la Composición Corporal, la Capacidad de Realizar Múltiples Sprints Repetidos y el Rendimiento del Salto Vertical en Jugadores de Bádminton de Élite

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SUMMARY: The purpose of this study was to assess the correlation between the body composition, multiple repeated sprint ability (MRSAB) test, and vertical jump performance. Fifteen voluntary elite Turkish badminton players participated in the study. The MRSAB test consisted of 2 repetitions of 4 movements (4x3m) separated by 30 seconds of passive recovery. The best time (BT), meantime (MT), total time (TT), and fatigue index (FI) were measured. Body composition was evaluated through dual-energy X-ray absorptiometry (DEXA). Squat jump (SJ) test for explosive power and countermovement jump (CMJ) test for elastic power were used. The main findings were that there was a significant correlation between MRSAB MT and TT with lean body mass, lean arm mass, and trunk lean mass (kg) of male badminton players. However, no significant correlation was observed among MRSAB MT, BT, and TT with another total/regional body composition of female badminton players (p>0.05). Moreover, the results of male badminton players showed that there was a significant negative correlation between FI and percentage ofbody fat (%BF), percentage of leg fat (%LF), percentage of trunk fat (%TF), and trunk mass. In addition, there was a significant negative correlation between FI with %BF, body fat mass kg, percentage of arm fat (%AF), arm fat mass, and %LF of female badminton players. It was also found in the study that there was a significant correlation between SJ and %LF; CMJ and %BF, body fat mass kg, %AF, %LF and leg fat mass kg. However, no significant correlation was observed among CMJ and SJ with other total/regional body compositions of male badminton players (p>0,05). Finally, changes in body composition are important issues for the physical performance level of badminton players as regional excess body fat may cause deterioration, especially in repeated-sprint ability and jumping performance.

KEY WORDS: Badminton; Body composition; Multiple repeated sprint; Squat jump; Countermovement jump.

INTRODUCTION

Speed, resistance, strength, coordination, reaction, foresight, game skills, and technical success are accepted as the prerequisites of the game in badminton (Baron *et al.*, 1992; Yumuk, 2004). Badminton players must meet the ball very quickly and adjust their body positions and speeds constantly throughout the game (Faude *et al.*, 2007). Therefore, due to the rapid nature of the game, it requires strength components such as maximal strength, quick strength, explosive power, power, flexibility, agility, and balance in movement patterns such as sudden changes in direction, jumps, runs, and kicks (Chin *et al.*, 1995; Abernethy & Russel, 1987). For this reason, a relationship between badminton performance, which requires lifting the bodyweight repeatedly against gravity and putting loads on the joints, and body fat mass is considered (Schwimmer *et al.*, 2003; Mascherini *et al.*, 2018). The ability of athletes to carry their body weight, increase their movement capacity along with body weight, and in addition, the ratio of body muscle, bone, and adipose tissue increase the importance of body composition studies. Saygın & Özs¸aker (2012) examined the body compositions and various motoric characteristics (flexibility, endurance, jumping, and speed)

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of individual and team athletes in their research and revealed that there was a statistically significant relationship between body mass indexes and motor skills of female athletes. As a result of examining the body mass index of elite and amateur badminton players and various parameters, Gucluover *et al*., (2012) stated that elite players had a lower body fat percentage than amateur players; they were taller, stronger, and more agile. Bhandari & Koley (2019) found out in their study that there were significant positive correlations between the explosive power of badminton players and height, weight, and body mass index.

While it is regarded essential that the development of basic motor skills in sports directly affects performance, it is argued that the body compositions of the athletes directly affect their motor characteristics and thus their sportive performance (Visnapuu & Jürimäe, 2009; Gucluover, 2012; Nikolaidis *et al*., 2019). As a result of their study, Ayuningtyas *et al*. (2021) stated long arms and legs, low body fat percentage and strong musculature in the arms, and the ectomorphic component with a slim body shape makes it easier for elite badminton players to move combined in all positions. Badminton players reveal a significant relationship between some anthropometric characteristics and motor performance characteristics such as higher reaction speed and agility (Abdullahi *et al*., 2017).

Previous studies investigated the anthropometric and physiological profiles of badminton players in terms of the level of expertise and sex, including comparisons with players in various nationalities (Ooi *et al*., 2009; Heller, 2010; Abián *et al*., 2012; Abdullahi *et al*., 2017). However, regarding elite badminton players, the correlation among total/regional body composition, multiple repeated sprint ability (MRSAB) test, and vertical jump performance test was observed to be limited.

In this study, the correlation between body composition and multiple repeated sprint ability tests and vertical jump performance was evaluated. With regards to this purpose, repeated sprint test on 4 points determined on the badminton court, squat jump test for explosive strength measurement, active jump test for elastic (reactive) power measurement, and Dual-energy X-ray absorptiometry (DEXA) measurement of the body composition of the athletes and the relationship among all was examined.

MATERIAL AND METHOD

Experimental Approach to the Problem Subjects. Voluntary 15 Elite (National) Turkish badminton players (n=8 men; n=7 women) voluntary participated in this study. After informing the players about the study verbally, they or their parents - if they were younger than 18 - were asked to sign a written informed consent for their participation. This study was conducted by the principles of the Helsinki Declaration. As for the ethical issues, it was approved by University Health Sciences Institute Scientific Research and Publication Ethics Committee on 28.06.2019 (Protocol number 16403).

Procedure. All measurements and tests were carried out during the pre-season period. The test sessions were completed in two days between 9:00 and 12:00 a.m. On the first day, anthropometry, body composition measurement jumping performance were carried out at the Laboratory of Kinanthropometry at the Faculty of Sport Sciences, University. On the second day, the multiple repeated sprint ability test (MRSAB) was carried out indoors on a hardwood floor at the badminton sports hall of the university. Subjects were warned not to take any drugs; drink coffee, and get involved in physical activities at least 24 hours before the test day.

Anthropometric and Body Composition Analysis. The badminton players' body mass (kg) was measured barefoot by using a scale (SECA, Hamburg) with a precision of 0.1 kg. While the players' head was maintained in the Frankfurt plane, height was measured with a stadiometer (SECA, Hamburg) with an accuracy of 0.1 cm.

Whole-body and regional composition (fat percentage, bone mass, muscle mass, and fat mass) was evaluated through DXA using a total body scanner the Dual-energy X-ray absorptiometry (Lunar Prodigy Pro; GE, Healthcare, Madison, WI, USA) considering the manufacturer's procedures. The scanner calibration was completed using phantoms as per the manufacturer's standard directions in the morning before the measurements. All scanning and analyses were performed by the same operator to ensure consistency. Before the assessment, all subjects were advised not to wear any jewelry or to have any metal on their bodies during the scanning process. To ensure a standard, the supine position was adopted during the scans, the subjects' knees and ankles were tied with a Velcro strap while their arms were extended by their sides. The typical duration of the examinations was from 6 to 8 minutes, depending on the height of the subject.

Vertical Jump Measurements. The testing was preceded by a standard warm-up procedure (5-minute self-paced running and 10 minutes of callisthenic and dynamic stretching). The participants were asked to perform jump tests (Squat Jump (SJ) and Counter Movement Jump (CMJ) to measure the explosive power of their lower limbs by using a Smart speed, (Fusion Sport Pty Queensland, Australia). Also, the participants were told to place their hands on their hips while jumping so that the effects of arm swing could be avoided. According to instructions provided for the squat jump, the subjects began to jump as high as possible when their knee reached approximately a 90° angle. When it came to the countermovement jump from the standing position, the researchers told the participants to do a maximal vertical thrust (stretch-shortening cycle) by bending their knees to a 90° angle. Finally, the participants were told to keep their bodies straight and descend with their knees fully extended during the jump. Any jump that was incorrectly performed was repeated. In line with previous studies, 1 minute of rest was allowed between consecutive trials, and 2–3 minutes between the series of different jumps (SJ, CMJ), to minimize the effects of fatigue (Copic *et al*., 2014). The measurements from the best performance of two trials were recorded and expressed in “cm”.

Multiple Repeated Sprint Ability Test (MRSAB). Multiple repeated sprint ability test for badminton players involving 4 changes of direction test was designed and specialized to measure both repeated sprint and COD abilities by Phomsoupha *et al*. (2018). The same conditions were used, consisting of 10 repetitions of each pattern with 30 seconds of passive recovery time. 1 movement is completed when the players touch each light [(L1-L4) left-right forecourt and left-right backcourt] with their rackets using their dominant hands (all participants were right-handed) and return to the center immediately. They were instructed to perform a total of 8 movements by visiting each light twice to complete 1 pattern. A 5-photocell lighting system (Flight Sports Corp., Ontario, Canada) and an android-based tablet were used during measurements. The lights of the system were placed at the corners and in the center of the court. After standardized warm-up (10 minutes), each participant performed 2 trials at moderate velocity as a familiarization. They waited for the first signal at the ready position for each pattern. The calculated parameters were MRSAB meantime, MRSAB best time, and MRSAB total time, Fatigue Index (FI), mean step number, step number of the best trial introduced by Fitzsimons *et al*. (1993) and Phomsoupha *et al*. (2018).

$$\text{Fatigue Index (\%)} = \left(100 \times \left[\frac{\text{Total Time}}{\text{Best Time}} \times 10\right] - 100\right)$$

FI was calculated based on the formula above where MRSAB total time is the sum of all the 10 repetitions (excluded recovery time) and MRSAB best time is the shortest repetition among all. Mean step number and step number of the best trial were determined by analyzing digital camera (GoPro 3+ Black Edition) recordings (60Hz) in Kinovea (version 0.8.15; France) motion analysis software. Figure 1 shows the positions of the 5-photocell lighting system. The camera was positioned on a 1m high tripod, at the right corner of the court, and the subject’s sagittal plane.

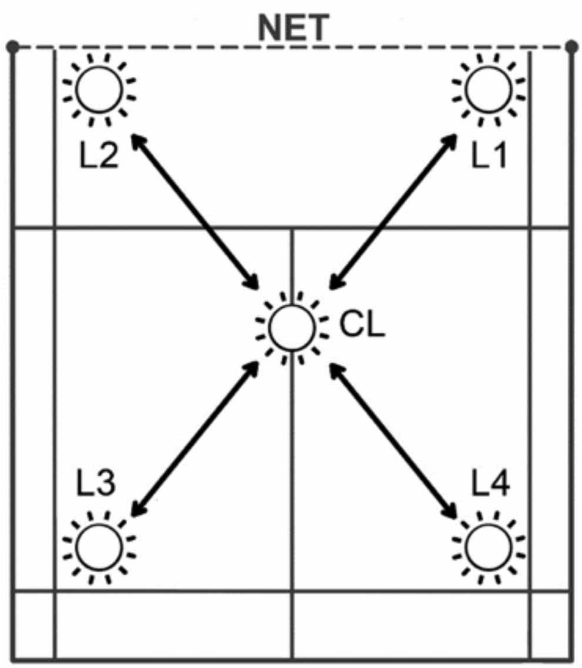

Fig. 1. The player needs to switch off the lights located 3m away from Center Light (CL) in an anticlockwise direction beginning from L1 to L4 twice to complete 1 pattern. It is mandatory to return to the CL for every 8 movements.

The trial was dismissed and repeated when any of the following errors occurred: (A) running towards the wrong target; (B) being unable to switch off the light; and (C) using the non-dominant hand.

Statistical Analyses. The data were statistically analyzed by using SPSS 23 software (SPSS Inc., Chicago, IL, USA) and presented as means and standard deviations. The level of significance was taken as 0.05 in the analyses. To test the normality of the data, Shapiro-Wilk test was applied. Finally, the Pearson correlation coefficient was used to analyze the correlation between body composition, multiple repeated sprint ability, and vertical jump performance test. Probability level was taken as ≤0.05.

RESULTS

The descriptive statistics of physical and total/regional body composition of elite badminton players are presented in Table I. The results of multiple repeated sprint ability and vertical jump performance tests are presented in Table II. In addition, the correlation coefficients between body composition, multiple repeated sprint ability, and vertical jump are shown in Table III and Table IV.

Table I. The descriptive statistics physical and total/regional body composition of elite badminton players.

Variables	Male Badminton Players		Female Badminton Players	
	Mean	Sd	Mean	Sd
Age (year)	17.2	1.4	16.4	1.4
Training Age (year)	8.3	1.8	7.7	1.0
Weight (kg)	63.2	6.9	55.0	5.4
Height (cm)	177.4	5.5	164.0	6.0
Body Fat Percentages (%)	14.2	2.2	25.4	5.4
Body Fat Mass (kg)	8.6	1.6	13.7	4.4
Lean Body Mass (kg)	52.1	6.3	39.4	2.1
Arm Fat Percentages (%)	14.3	3.4	29.2	6.1
Arm Fat Nass (kg)	1.0	0.2	1.6	0.4
Lean Arm Mass (kg)	6.1	1.0	3.9	0.5
Leg Fat Percentages %	17.2	2.9	30.1	4.6
Leg Fat Mass (kg)	3.8	0.8	5.8	1.6
Lean Leg Mass (kg)	18.2	2.9	13.3	1.1
Trunk Fat percentages (%)	11.0	2.1	21.6	7.0
Trunk Fat Mass (kg)	3.1	0.7	5.6	2.5
Trunk Lean Mass (kg)	24.8	2.9	19.5	0.8

Table II. The results of multiple repeated sprint ability and vertical jump performance test of elite badminton players.

Variables	Male Badminton Players (n=8)		Female Badminton Players (n=7)	
	Mean	Sd	Mean	Sd
MRSAB meantime (sec)	13.03	0.57	14.19	0.66
MRSAB best time (sec)	11.81	0.39	12.85	0.67
MRSAB total time (sec)	130.25	5.56	141.86	6.61
Fatigue Index (%)	10.38	4.51	10.46	2.54
Mean step number	39.05	2.27	41.44	6.79
Best of step number	34.37	2.73	36.14	4.95
SJ(cm)	37.07	4.40	29.02	3.52
CMJ(cm)	37.40	5.21	28.61	2.29

MRSAB: Multiple Repeated Sprint Ability; SJ; Squat jump; CMJ: Countermovement jump; SD: Standard deviation.

Table III. Relationship between total/regional body composition, multiple repeated sprint ability, and vertical jump performance on male badminton players.

	MRSAB meantime(sec)		MRSAB best time(sec)		MRSAB total time(sec)		Fatigue Index(%)		SJ(cm)		CMJ(cm)	
	r	p	r	p	r	p	r	p	r	p	r	p
Body fat (%)	-,621	,100	,680	,063	-621	,100	-	,006	-,297	,47	-,651	,081
Body fat mass (kg)	-,187	,658	,554	,154	-,187	,658	-,614	,106	,101	,81	-,459	,253
Lean body Mass (kg)	,756*	,030	-,299	,471	,755*	,030	,469	,241	,656	,07	,343	,406
Arm Fat percentages (%)	-,372	,364	,545	,163	-,371	,376	-,565	,145	-,403	,32	-,661	,074
Arm Fat Mass (kg)	-,049	,909	,564	,145	-,049	,908	-,479	,229	,110	,79	-,548	,159
Lean Arm Mass (kg)	,713*	,047	-,281	,500	,710*	,048	,441	,274	,624	,01	,411	,312
Leg fat percentages (%)	-,500	,207	,649	,082	-,501	,206	-,806*	,016	-,070	,86	-,561	,148
Leg fat mass (kg)	-,010	,982	,452	,261	-,010	,980	-,461	,250	,259	,53	-,348	,398
Lean leg mass (kg)	,479	,230	,339	,411	,480	,229	-,178	,673	,052	,90	-,568	,142
Trunk Fat percentages	-,701	,053	,621	,10	-,700	,053	-	,006	-,418	,30	-,592	,122
Trunk Fat Mass (kg)	-,393	,336	,573	,138	-,392	,337	-,720*	,044	-,117	,78	-,485	,224
Trunk Lean Mass (kg)	,730*	,040	-,262	,531	,729*	,040	,412	,310	,664	,07	,314	,450

MRSAB: Multiple Repeated Sprint Ability; SJ; Squat jump; CMJ: Counter movement jump; *p<0.01; **p<0.01.

Table IV. Relationship between total/regional body composition, multiple repeated sprint ability and vertical jump performance on female badminton players.

	MRSAB mean time (sec)		MRSAB best time (sec)		MRSAB total time (sec)		Fatigue Index (%)		SJ(cm)		CMJ(cm)	
	r	p	r	p	r	p	r	p	r	p	r	p
Body fat (%)	.382	.397	.713	.072	.384	.395	-.785*	.037	-.712	.073	-.782*	.038
Body fat mass (kg)	.319	.486	.644	.118	.321	.483	-.756*	.049	-.741	.057	-.793*	.033
Lean body Mass (kg)	-.447	.314	-.426	.340	-.447	.315	.073	.877	-.355	.435	-.145	.757
Arm Fat percentages (%)	.309	.501	.688	.088	.311	.498	-.873*	.010	-.722	.067	-.795*	.033
Arm Fat Mass (kg)	.264	.567	.612	.144	.266	.564	-.797*	.032	.630	.130	-.703	.078
Lean Arm Mass (kg)	-.268	.562	-451	.310	-.268	.561	.447	.314	.497	.256	.529	.222
Leg fat percentages (%)	.338	.458	.670	.100	.340	.456	-.771*	.042	-.850*	.015	-.894**	.007
Leg fat mass (kg)	.253	.583	.579	.173	.255	.581	-.736	.059	-.873*	.010	-.904**	.005
Lean leg mass (kg)	-.345	.449	-.259	.576	-.344	.449	-.089	.850	-.408	.363	-.281	.542
Trunk Fat percentages (%)	.403	.370	.702	.079	.405	.367	-.723	.066	-.586	.167	-.664	.104
Trunk Fat Mass (kg)	.379	.402	.683	.090	.381	.399	-.728	.064	-.649	.115	-.716	.070
Trunk Lean Mass (kg)	-.368	.416	-.426	.340	-.368	.417	.228	.622	-.534	.217	-.237	.609

MRSAB: Multiple Repeated Sprint Ability; SJ; Squat jump; CMJ: Countermovement jump; *p<0.01; **p<0.01.

According to results of the study, show that the correlation between MRSAB MT and TT with lean body mass, lean arm mass, and trunk lean mass of male badminton players. Moreover, the results of male badminton players show that the correlation between FI and body composite on variables, such as percentage of body fat, percentage of leg fat, percentage of trunk fat, and trunk mass. However, no significant correlation was found among countermovement jump, squat jump, and another total/regional body compositions (p>0.05). The results of female badminton players showed that there was a correlation between FI and body composition variables, such as percentage body fat, body fat kg, percentage of arm fat, arm fat mass, and percentage of leg fat. There was also a significant correlation between SJ and percentages of leg fat. Moreover CMJ and percentage of body fat, body fat kg, percentage of arm, percentage of leg fat, and leg fat kg.

DISCUSSION

The purpose of this study was to assess the correlation between the body composition, multiple repeated sprint ability (MRSAB) test, and vertical jump performance. This study was the first to investigate the relationship between body composition, which was measured by DXA and multiple repeated sprint ability (MRSAB), and vertical jump performance of national badminton players. Due to limited research in the literature, similar studies were used as support in the discussion.

According to studies examining the anthropometric characteristics of badminton players, it was found that the badminton players in the top ranking in the world were 5cm taller on average than the badminton players in the lower ranks. Deriving from this perspective, it was inferred that being taller provided an advantage in the hits made over the net (Phoumsoupha & Laffaye, 2015). The height of the badminton players participated in this present study was consistent with elite male and female badminton players studied elsewhere (Güçlüöver *et al*., 2012; Abian-Vicen *et al*., 2013; Hazır *et al*., 2018; Abdullahi *et al*., 2017).

The weight of the male badminton players whose values were 66,90±5,29, 67,4±9,8 and 73,5±6,8 respectively in this study was lower than that of elite badminton players reported in several studies (Güçlüöver *et al*., 2012; Hazır *et al*., 2018). Similarly, the weight of the female badminton players in this study was similar to that reported for elite female badminton players (Hazır *et al*., 2018). Excess body weight would be detrimental in moving swiftly around the court as well as when jumping to smash the shuttle. The weight of players in the current study was also lower than those of previous studies in elite female badminton players who weighted 59,45±3,37 kg, 61,2± 4,5 kg, 60,7± 7,3 kg. (Abian-Vicen *et al*., 2013; Abdullahi *et al*., 2017).

Phomsoupha & Laffaye (2015) stated in their meta-analysis study that the average body fat percentage was 12.85 % in elite male badminton players, and 18.45 % in elite female badminton players, and the body mass index ranged from 18.9 to 23.6 %. These findings are similar to those of several studies. For example, Güçlüöver *et al*. (2012) found that elite players were taller, had a lower body fat percentage, and had more fat-free mass than amateur players. Although the body fat percentage value of male badminton players participating in this research was similar to the studies in the literature, the body fat percentage value of female badminton players was higher. The reason for this disparity might be due to different methods used to obtain data on body fat percentage, different data collection times (pre or during the season), and differences in training programs (Phoumsoupha *et al*., 2018; Akdogan & Güven, 2021).

General patterns of movement in badminton involve repetitions of short movement with many changes of direction at high intensity. The ability to repeat high intensity, short-duration efforts followed by a short recovery period has been termed "repeated-sprint ability" (RSA) (Fitzsimons *et al*., 1993). The ability to sprint and to change direction is essential components of physical performance in racket sports (Phomsoupha *et al*., 2018). Consequently, it seems obvious that badminton players should maximize their RSA capabilities to enhance their on-court success (Walklate *et al*., 2009).

The present study showed that there was a significant correlation between MRSAB mean and total time with lean body mass, lean arm mass, and trunk lean mass kg of male badminton players. However, no significant correlation was observed among MRSAB mean, best, and total time with another total/regional body composition of female badminton players (p>0.05). Moreover, the results of male badminton players showed that a significant negative correlation between FI and body composition variables such as percentage of body fat, percentage of leg fat, percentage of trunk fat, and trunk mass. In addition, there was a significant negative correlation between FI and body fat percentage, body fat (kg), percentage of arm fat, arm fat mass, and percentage of leg fat of female badminton players.

However, to our knowledge, there are very few studies to correlate body composition variables with repeated sprint ability (RSA) performance, but the scientific literature brings forward a variety of sports, such as soccer and handball (Brocherie *et al*., 2014; Moss *et al*., 2015; Atakan *et al*., 2017). The present study found that there was a significant negative correlation between FI with %body fat, leg fat, trunk fat, and trunk mass of male badminton players. In contrast with the results of this study, some studies (Brocherie *et al*., 2014) reported that the sum of six skinfolds and the adipose mass index was largely correlated with sprint decrement scores in male soccer players. In this study, there was a significant correlation between MRSAB mean and total time with lean body mass, lean arm mass, and trunk lean mass of male badminton players. Contrary to our study, Atakan *et al*. (2017) found that there was a negative relationship between body mass and repeated sprint time in male soccer players. In this study, lean body, arm, and trunk mass were correlated positively with decreases in speed performance in male badminton players. This result shows that an increase in total mass is detrimental to repeated sprints. The present study showed that both totals/regional body fat percentage and kg were significantly negatively correlated to FI of female badminton players. Similar to our study, Moss *et al*. (2015) reported that the sum of skinfolds showed relationships with for average repeated sprint efforts (25 m), indicating that higher skinfold values were associated with slower times in female handball players. The current results show that an increase in total/regional BF percentage and fat weight negatively affects repeated-sprint ability performances in badminton players.

As another finding of this study, there was a significant correlation between SJ and percentages of leg fat, and CMJ and percentage of body fat, body fat mass kg,percentage of arm fat, percentage of leg fat, and leg fat mass kg. However, no significant correlation was observed among countermovement jump and squat jump with another total/regional body composition of male badminton players (p>0.05). However, to our knowledge, there are very few studies to correlate body composition variables and, vertical jump performance in badminton players. The author accessed only two studies that involved correlations of BF and vertical jump performance in badminton players. The results of this study by Abdullahi *et al*. (2017) found a significant correlation between % BF with vertical jump performance in either males or females badminton players. Similar to this study, Ayuningtyas *et al*. (2021) reported a significant negative correlation between endomorphic components and vertical jump in either males or females badminton players. Another study stated that higher skinfold values were found to negatively affect both maximal and average CMJ height in female handball players (Moss *et al*., 2015). The current results show that an increase in total/regional BF percentage and weight negatively affects vertical jump performances, particularly in female badminton players. Therefore, the decrease in fat mass may substantially improve elastic (reactive) power. Moss *et al*. (2015) recommended that greater gluteal and calf girths were also beneficial for CMJ, suggesting that increased muscle mass in these areas contributes to movements involving a strength and power component.

This study was limited to the athletes (7-8) selected for the national badminton team. Thus, it might be risky to generalize the results of the study to a larger population, different age groups, and nationalities. Another limitation of the study was that physical performance tests were taken only before the competition period, but not after. Therefore, whether there was a change in the physical performance of players during the competition period stayed unclear.

CONCLUSION

The results of the study revealed the existence of a significant correlation between some total/regional body composition, multiple repeated sprint ability (MRSAB) tests, and vertical jump performance in badminton players. In conclusion, body composition is a significant factor that affects the physical performance level of badminton players since regional excess body fat may detriment to performance. The major findings of this study show that badminton players with less body fat and increased lean mass percentage before season, present an advantage for certain physical performance indicators.

AKDOGAN, E.; KANAT, E. A.; SIMSEK, D.; CERRAH, A. O.; BIDIL, S.; BAYRAM, I. & AKTI, Y. Relación entre la composición corporal, la capacidad de realizar múltiples sprints repetidos y el rendimiento del salto vertical en jugadores de bádminton de élite. *Int. J. Morphol., 40(3)*:720-727, 2022.

RESUMEN: El propósito de este estudio fue evaluar la correlación entre la composición corporal, la prueba de capacidad de sprint repetido (MRSAB) y el rendimiento del salto vertical. Quince jugadores voluntarios de bádminton turcos de élite participaron en el estudio. El test MRSAB consistió en 2 repeticiones de 4 movimientos (4x3m) separados por 30 segundos de recuperación pasiva. Se midieron el mejor tiempo (BT), el tiempo medio (MT), el tiempo total (TT) y el índice de fatiga (FI). La composición corporal se evaluó mediante absorciometría de rayos X de energía dual (DEXA). Se utilizó la prueba de salto desde la sentadilla (SJ) para la potencia explosiva y la prueba de salto con contramovimiento (CMJ) para la potencia elástica. Los principales hallazgos fueron una correlación significativa entre MRSAB MT y TT con la masa corporal magra, la masa magra del brazo y la masa magra del tronco (kg) de los jugadores de bádminton hombres. Sin embargo, no se observó una correlación significativa entre MRSAB MT, BT y TT con otra composición corporal total/regional de jugadoras de bádminton (p>0,05). Además, los resultados de los jugadores hombres de bádminton mostraron que había una correlación negativa significativa entre FI y el porcentaje de grasa corporal (% BF), porcentaje de grasa en las piernas (% LF), porcentaje de grasa en el tronco (% TF) y masa del tronco. Además, hubo una correlación negativa significativa entre FI con %GC, masa de grasa corporal en kg, porcentaje de grasa en el brazo (%AF), masa de grasa en el brazo y %LF de las jugadoras de bádminton. También se descubrió en el estudio que había una correlación significativa entre SJ y %LF; CMJ y %BF, masa grasa corporal kg, %AF, %LF y masa grasa de piernas kg. Sin embargo, no se observó una correlación significativa entre CMJ y SJ con otras composiciones corporales totales/regionales de los hombres jugadores de bádminton (p>0,05). Finalmente, los cambios en la composición corporal son cuestiones importantes para el nivel de rendimiento físico de los jugadores de bádminton, debido a que el exceso de grasa corporal regional, puede causar un deterioro, especialmente en la capacidad de repetir sprints y en el rendimiento de los saltos.

PALABRAS CLAVE: Bádminton; Composición corporal; Múltiples sprints repetidos; Squat jump; Salto con contramovimiento.

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