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AN ANALYSIS OF EXPLOSIVE QUALITIES OF MALE STUDENTS WHO TOOK BADMINTON COURSES

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Abstract: The aim of this study is comparative assessment of rapidness of male students who took up Badminton course, with the group who didn't take up badminton course and the determination of the reasons of possible differences between the two groups at Physical Education and Sport Academy. With that aim, some measurements such as motorik features(velocity, vertical jumping, stepping, attack, static jumping) and some biological features (age, height, kilo) of 28 male students that are in the same class between 19-22 were recorded who took up (n=12) badminton course and who didn't (n=16) in 2008-2009 academic year. According to the measurement results, while there has been statistically, significant differences ($p<0,05$) in terms of averages of vertical jumping(cm), standing long jump and stepping(cm), there has not been any statistically significant difference ($p>0,05$) in terms of the averages of biological age(year), height(cm), kilo(kg), 10 meter(sec.), attack test between the students who voluntarily took the badminton course and who didn't.

Key Words: Badminton, motorik features, explosive power,

Badminton Dersi Alan Erkek Öğrencilerin Patlayıcı Güç Özelliklerinin İncelenmesi

Özet: Bu çalışmanın amacı Beden Eğitimi ve Spor Yüksek Okulu'nda badminton dersi alan erkek öğrencilerin patlayıcı güç özelliklerinin incelenmesi, badminton dersi almayan grupla karşılaştırılması ve olası farklılıkların nedenlerinin belirlenmesidir. Bu amaçla yaşları 19 – 22 arasında değişen 2008–2009 eğitim-öğretim döneminde badminton dersini alan tüm öğrenciler (n=12) ile aynı sınıfta olup, badminton dersi almayan (n=16), toplam 28 erkek öğrencinin bazı biyolojik (yaş, boy, kilo) ve biyomotor özelliklerinin (sürat, dikey sıçrama, adım alma, hamle, durarak uzun atlama) değerleri alınarak elde edilen veriler karşılaştırılmıştır.

Anahtar Kelimeler: Badminton, motorik özellikler, patlayıcı güç, raket sporları

Introduction

Badminton is a branch of sports common throughout the world, which is also included in today's modern Olympics programme (Yorulmazlar and Kepoğlu, 2005). The popularity of badminton has been rising and therefore, the number of people playing badminton has been increasing, too (Chin ve ark., 1995).

The primary goal of every player and trainer is to increase performance. Explosive strength training in badminton is necessary for both hitting moves and training the feet (Bompa, 1998). The aims of this study are to analyse the explosive qualities of 28 students, 12 of whom took the badminton course in 2008-2009 academic year (n=12) and 16 of whom, being in the same group, did not take that course (n=16), to compare the two groups and to detect the causes of possible differences.

Material and Method

A total number of 28 male students, 16 of whom, being in the same group, did not take the badminton course (n=16) and 12 of whom took the badminton course (n=12) in 2008-2009 academic year in K.B.E.S.Y.O. is the research universe.

Ethical approval for the study was granted and volunteer participation was secured having informed the subjects about the aim of the study before the tests, therefore, their willingness and motivation were increased. The tests were presented to the students and applied as an example. 2 tests were performed with 10 minute intervals. Special attention was paid to perform the tests at the same time of the day. Each test was performed by the same researcher. All test measurements of the subjects were done in K.B.E.S.Y.O. 75. Year Olympic Sports Hall.

Limitations: The study is limited to a total number of 28 male students having taken the badminton course (n:12) and having not taken this particular course (n:16)

Hypotheses: Hypotheses were put forward in relation to the analysis criteria with the aim of determining the differences between the two groups as a result of a series of plyometric and motoric tests applied to the students having taken the badminton course and to those having not. These tests are biological age, height, body weight, 10 Meter sprint test, vertical jump, standing broad jump, attack distance, step test.

Appliances

The test tools we used in our research are;

Weight Measurement: For the weight measurements an Arzum weighing scale with 0,1 kg sensitivity was used.

Height Measurement: Measurement of height of the subjects through the gym wall of the previously prepared metric scale was measured with steel tape.

Vertical Jump: The candidate whose vertical jump was to be tested was asked to stand on the rubber circular part of the jump meter after placing the vertical jump device (Jump meter) on the athlete's abdominal (Akçakaya, 2009).

10 Meter Sprint: The test was applied by determining the start point, 0 meter, and the finish point, 10 meter and placing a photocell sensitive to 0, 01 on the start and finish points.

Standing Broad Jump: The subjects marked the back of the line, with double-leg maximal exercise were studied using the most long-distance jump. Start with the athletes had left the line closest to the distance between the trace was measured in meters.

Step Test: The subject made the move right foot forward tip of the finger-point to leave. Move your right knee touch the ground during. Installed on the left knee 90 degrees to position the string broken body was left. The left foot heel-to-one tape removed. The subject places a finger in the right foot returned to the starting position the hard way. The right lane with his right foot jumped ahead of the marked location of the subject. Presses the point was more a sign of the left foot heel. The marked point is made before making the next leap with a jump distance between the marked points were measured.

Attack (Move) Test: The starting point is determined. The subject made the move right foot forward tip of the finger-point to leave. Move your right knee touch the ground during. Installed on the left knee 90 degrees to position the string broken body was left. Finger tip of the right foot presses the point of measurement was marked in the left foot heel presses.

Statistical Analysis

Analysis criteria were determined taking into account the criteria used for similar researches in the literature.

In order to determine the statistically significant difference among averages, whether or not a homogeneous variance assumption was provided between the two groups was checked by LEVENE'S test statistics. The significant difference among the averages was evaluated by the "T" test. $P < 0,05$ value was accepted as significant statistically. All statistical analysis was made on Statistica 7.0 (StatSoft Inc. Tulsa, OK, USA) software (Özdamar, 2003).

Findings

For the age, height, weight, 10 meter, attack variants by t test under homogeneous variance assumption, no statistically significant difference was observed between the average values of the volunteer students having taken the badminton course and those having not ($p > 0,05$) (Table:1, Table:2).

For the vertical jump, standing broad jump and step variants by t test under homogeneous variance assumption, statistically significant difference was observed between the average values of the volunteer students having taken the badminton course and those having not ($p > 0,05$) (Table:1, Table:2).

Table 1: Identifying Qualities of the Students Having Taken and Having Not Taken the Badminton Course

Parameters	Taken(n=12)	Not Taken(n=16)
Biological Age(years)	20,58±1,08 19-22	20,13±0,88 19-22
Body Weight(kg)	71,58±5,29 66,4-83	73,08±8,69 60-87
Height (cm)	179,33±5,42 172-192	177,19±6,33 168-190
10 meter (s)	2,40±0,09 2,25-2,59	2,47±0,10 2,29-2,61
Vertical Jump (cm)	59,375±5,58 49,0-72	53,47±3,55 45,0-59,5
Standing Broad Jump (cm)	232,58±16,83 202,5-276,0	210,59±18,02 172,0-233,5
Attack Tests (cm)	131,79±28,63 111,5-220,0	122,34±7,06 108,5-130,5
Step Tests (cm)	210,50±14,35 184,0-237,0	187,50±14,38 153,5-207,5

Table 2: "T" Test and Variance Homogeneity Assumption Values

"T" Test						Variance Homogeneity	
	(+) when variance equality exist, (-) otherwise	t	Degrees of Freedom	"t" test p value	Difference of Averages	F Value	P Value
Biological Age(years)	+	1,232	26	0,229 b	0,458	1,451	0,239 b
	-	1,196	20,920	0,245 b	0,458		
Height(cm)	+	-,530	26	0,601 b	-1,50625	0,986	0,330

	-	-,567	25,127	0,575 b	-1,50625		b
Body	+	0,943	26	0,354 b	2,14583	3,072	0,091
Weight(kg)	-	0,965	25,472	0,344 b	2,14583		b
10 meter(s)	+	-1,810	26	0,082 b	-,07000	1,222	0,279
	-	-1,847	25,344	0,076 b	-,07000		b
Vertical	+	3,421	26	0,002 a	5,9063	1,191	0,285
Jump(cm)	-	3,213	17,523	0,005 a	5,9063		b
Standing Broad	+	3,286	26	0,003 a	21,9896	0,983	0,331
Jump (cm)	-	3,319	24,669	0,003 a	21,9896		b
Attack Tests(cm)	+	1,277	26	0,213 b	9,4479	2,634	0,117
	-	1,118	12,009	0,286 b	9,4479		b
StepTests(c)	+	4,191	26	0,000 a	23,0000	0,003	0,956
	-	4,192	23,873	0,000 a	23,0000		b

The statistically significant difference between two tests is indicated as a= $p<0,05$, and no statistically significant difference was indicated as b= $p>0,05$.

For the age, height, weight, 10 meter, attack variants by t test under homogeneous variance assumption, no statistically significant difference was observed between the average values of the volunteer students having taken the badminton course and those having not ($p>0,05$).

For the vertical jump, standing broad jump and step variants by t test under homogeneous variance assumption, statistically significant difference was observed between the average values of the volunteer students having taken the badminton course and those having not ($p>0,05$) (Table:1, Table:2).

Discussion and Conclusion

In this study, the explosive qualities of 28 students, 12 of whom took the badminton course in 2008-2009 academic year ($n=12$) and 16 of whom, being in the same group, did not take that course ($n=16$) were compared, the differences between the student groups were determined and the results were compared to the results of similar studies in the literature. First, the application group consisted of 12 persons. It constrains us. However, a number that's about all who choose from the list of elective courses.

There was no statistically significant difference in the comparison of the biological measurements (age, height, body weight) of the students having taken the badminton course and of those having not taken that particular course ($p>0,05$). The possible reason for that is the fact that the average ages of both groups are similar.

Of the motoric tests, there was no statistically significant difference between the averages of 10 meter agility shuttle, attack test. Our findings support the idea that these motoric tests do not have role which distinguishes the explosive quality of badminton or that it may have been because of the training duration. When we check the results of other researchers in terms of biometric tests (Table 3).

Table 3: Vertical Jump, Step, Standing Broad Jump Values

	Researchers	Work Groups	N	Age Group	Arithmetic Mean	Standard Deviation
Vertical Jump	Taşkın C. Toksöz İ.(2010)	Taken Bad.	12	20,58±1,08	59,37	5,57
		Not Taken Bad.	16	20,13±0,88	53,46	3,55
	Kafkas M.Emin (2009)	National bad.pl.	10	11,20±0,6	31,70	4,37
		Amateur bad.pl.		11,80±0,63	27,00	3,52
	Angioluci F. (2009)	Male bad.pl.	10	17,24±1,18	36,70	6,00
		Female bad.pl.		15,21±2,06	27,20	2,10
	Göral K. (2008)	Tennis	15	20,4±0,69	65,20	8,58
		Volleyball		24,1±3,21	104,60	20,27

	Revan S. (2007)	T national bd.p.	12	16,4±0,7	47,10	6,80
		Foreign bad.pl.	13	16,9±0,9	47,50	5,50
	Cheong O.(2007)	Male elite bad.pl	10	26,1 ± 3,7	35,90	3,90
	Gelen E. (2006)	1.division	21	18,3±3,02	51,20	6,66
		2.division	26	18,5±2,87	45,40	6,58
	Lieshout K. (2002)	Male elite bad.pl.	8	17±1	53,00	4,00
Female elite b.pl.		7	16±1	35,00	6,00	
Step	Taşkın C. Toksöz İ.(2010)	Taken B.	12	20,58±1,08	210,50	14,35
		Not Taken B.	16	20,13±0,88	187,50	14,38
	Baser O. (2003)	Played B.	8	12-15	64,62	6,47
		Not Played B.		12-15	68,25	4,77
Standing Broad Jump	Taşkın C. Toksöz İ.(2010)	Taken B.	12	20,58±1,08	232,58	16,83
		Not Taken B.	16	20,13±0,88	210,59	18,01
	Gábor G. (2009)	Ice Hockey Nat.	20	16,45±0,51	230,88	15,47
		Ice Hockey Am.		16,62±0,50	234,39	15,69
	Hugnes M.G. (2008)	Male bad.pl.	43	16,9±1,1	242,00	14,00
		Female bad.pl.	49	16,8±1,3	196,00	18,00
	Arabacı R. E. (2007)	Male bad.	14	13,8±1,7	193,90	28,60
		Female bad.pl.	13	13,2±1,7	156,70	21,20
	Yıldız S. (2002)	Male national	9	14,0±1,32	183,56	20,25
		Female national		14,0±0,71	176,17	9,75

Explanation of Abbreviations: Badminton Taken(Taken B): Those who took the badminton course, Badminton Not taken(Not taken B): Those who did not take the badminton course, arithmetic mean

Vertical Jump: Analysing the data which we acquired in vertical jump tests, significant difference ($p < 0,05$) was detected between the students who took the badminton course and those who did not.

Kafkas M. The values in Kafkas M. Emin and his friends' study (Kafkas, 2009) are lower than those in our study. The reason for this is thought to be the fact that the age group of the athletes in the study ($11,20 \pm 0,6$) was on the lower limit of expecting a chronic effect of training and it was also quite lower than the age group of the athletes (in a suitable age for optimal training load) participated in our study.

Angioluci F. The findings acquired by Angioluci F. (Angioluci, 2009) in his study with male badminton players have lower values than the findings acquired in our study. Likewise, the findings acquired by Revan S. (Revan, 2007) in his study with Turkish National Badminton Team and female badminton players have lower values than the findings acquired in our study. The reason for this can be the fact that the athletes in the studies carried out by Angioluci F. and Revan S. are on the limit of reaching the age of optimal training (18 for males, 16 for females), and our subjects were at suitable ages for maximal load.

Göral K. The findings acquired by Göral K. (Göral, 2008) in his study with tennis players have higher values than the findings acquired in our study. Likewise, test results he acquired from volleyball players have higher values than the findings acquired in our study. And one of the probable reasons of this is that the athletes in Göral K.'s study were selected from different branches of sports.

Cheong O. The findings acquired by Cheong O. (Cheong, 2007) in his study with male badminton players have lower values than the findings acquired in our study. Probably, the reason for this is rooted in the differences of testing methods or in the fact that the athletes tested are in the elite performance group.

Gelen E. The findings acquired by Gelen E. (Gelen, 2006) in his study with tennis players of the major league have lower values than the findings acquired in our study with students who played badminton and no statistically significant difference was detected between our findings acquired from the students who did not play badminton and those of his. Likewise, test results he acquired from tennis players of second division have lower values than the

findings acquired in our study. Probably, the reason for this is that the athletes in Gelen E.'s study were selected from different branches of sports and they were of a younger age group.

Lieshout K. The findings acquired by Lieshout K. (Lieshout, 2002) in his study with male badminton players have lower values than the findings acquired in our study. Likewise, test results he acquired from a female badminton team have lower values than the findings acquired in our study. Probably, the reason for this is that the athletes in Lieshout K.'s study were not old enough for maximal training load and they were of a younger age group in comparison with the athletes in our study.

The fact that jumping moves are quite frequent during a badminton game and we applied the tests at the end of the term of the badminton course which was taken in 2008-2009 academic year is thought to have created an opportunity for the improvement of the jumping skills. Other findings of ours are supportive of this result, too.

Step Test: When the data which we acquired in step tests were analysed, significant difference ($p < 0,05$) was detected between the students who took the badminton course and those who did not.

Başer O The step test findings acquired by Başer O (Başer, 2003) from 12-15 age group badminton players have lower values than the findings of our study. Probably, the reason for this is that the athletes in the study carried out by Başer O. are of a younger age group in comparison to the age group of the athletes in our study. Having high step test values which is an important quality for the domination of the game field in badminton is thought to be necessary for badminton players.

Standing Broad Jump: Gábor G. The findings acquired by Gábor G. (Gábor, 2009) in his study with national ice hockey players have lower values than the findings acquired in our study. Probably, the reason for this is that the athletes in Gábor G.'s study were selected from different branches of sports and they were of a younger age group. The findings acquired by Göral K. in his study with ice hockey players have higher values than the findings acquired in our study. It is thought that the reason for that is the difference of testing methods.

Hugnes M.G. The findings acquired by Hugnes M.G. (Hugnes, 2008) in his study with male athletes have higher values than the findings acquired in our study. It is thought that the reason for that is the difference of testing methods. The test results he acquired from female athletes have lower values than the findings acquired in our study. It is thought that the reason for that is the difference of genders.

Arabacı R.E. The findings acquired by Arabacı R.E. (Arabacı, 2008) in his study with male badminton players have lower values than the findings acquired in our study. Likewise, test results he acquired from female badminton players have lower values than the findings acquired in our study.

Yıldız S. The findings acquired by Yıldız S. (Yıldız, 2002) in his study with national male badminton players have lower values than the findings acquired in our study. Likewise, test results he acquired from the female national badminton team have lower values than the findings acquired in our study. The reason for the difference between our findings and these two studies is probably that the average age of the selected subjects were not the same (Mills, 1977)(Hensley, 1979).

The reason for this is thought to be that the athletes in Yıldız S.'s study were of a younger age group in comparison to the athletes in our study.

The results of this test are in parallel with the vertical jump test results. The reasons for that are the jump move in standing broad jump our findings are supportive of this result. As a conclusion; for the first time in our country a study was carried out for badminton on this age group. No statistically significant difference was detected among the averages of biological age, height and weight of the volunteer students having participated in the study ($p > 0,05$). While a statistically significant difference ($p < 0,05$) was detected between those having taken the badminton course and those having not in terms of vertical jump, standing broad jump and step averages, there was no statistically significant difference ($p < 0,05$) between those having taken the badminton course and those having not in terms of 10 meter, step test. As a result, we are firmly of the opinion that the results we obtained will contribute to the development of the badminton sport in our country. We also believe that those findings will contribute to the process of learning and support the trainers, as well.

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