

Effects of badminton training on some physical parameters in badminton players aged 10 to 12 years

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Abstract

This study aimed to determine some physical parameters of badminton players in the ages of 10-12. Fifteen badminton players in 10-12 years old volunteered to participate. The players continued their badminton training for 8 weeks. After and before the 8 week training, their 15 m speed, vertical jump, standing broad jump, hand grip strength and flexibility tests were conducted. To analyses the data, paired t-test was used to compare the pre- and post-test tests. After the badminton training of the 8 weeks, subjects' vertical jump, the hand grip strength (right hand) and flexibility performances increased significantly ($p < 0.05$). There was no significant difference in standing broad jump, 15 m speed and left hand-grip strength between pre- and post-test ($p > 0.05$). As a result, it can be said that the badminton training of an 8-week might improve vertical jump, flexibility and hand grip strength in 10-12 years old badminton players. However, the training may not have any effect on their 15 m speed and standing broad jump performance.

Keywords: Badminton, flexibility, horizontal jump, vertical jump.

INTRODUCTION

Badminton is a sporting activity characterized by long, high-intensity movements interspersed with rest periods. Badminton is a sports diet that is also needed in aerobic capacity with more anaerobic. Badminton has short-term maximal or submaximal loads and short rest periods as in other paddle sports. Such sports are particularly regarded as prerequisites for speed, endurance, strength, coordination reaction, perception, game skills and technical success. It is stated that in badminton game, which is a competitive non-contact sport, there is a need for splashes, movements, quick change of direction and fast arm movements (13).

Badminton brief information about goose made of a ball and shuttlecock is a game of Badminton, the ball over the net competitors' area and disposal to ensure the return objective one based on sports. Badminton, easily learnable, male and female, 7 years

of age 77 up to the age of all ages group is one of the rare sports where people can do (18).

Tennis games opponents call from the group due to. How the game badminton is played on a court marked for both singles and doubles matches. The doubles court is 6.1 metres (20 feet) wide and 13.4 m (44 ft) long, and the singles court is a little smaller. The net is 1.55 m (5 ft 1 inch) high at the edges and 1.524 m (5 ft) high in the centre. Badminton court to begin a singles game, players stand in diagonally opposite service courts (see diagram at right) and the server then serves the shuttlecock underhand from below the waist. If the receiver thinks the serve is a fault, meaning it will land outside the receiver's service court, he or she can leave it and win the point if it does go out. But if the receiver thinks the serve is good, he or she must return it before it bounces. If the return is good, a rally begins the rally continues until someone wins it by hitting a good shot which their opponent cannot return, or until someone loses it by hitting a fault. Faults include hitting the shuttlecock

into the net, hitting it outside the court, or hitting it twice with two separate shots before it goes over the net. Whoever wins the rally earns one point, and serves to start the next point. Players can use a range of shots during a rally, including drop shots, drives, clears, smashes, kills, net shots and push shots. Top players learn to disguise their shots, and try to trick the opponent into thinking they're about to hit one type of shot, but then hit a very different type of shot, hoping to win the point by surprising the opponent. Play continues until one player wins the game by being the first to earn 21 points, with a margin of at least 2 points. For example, if the score is 21 to 19, the game is over. But if the score is 21 to 20, the game continues. If the player with 21 points then wins a point, the score is 22 to 20 and the game is over. Matches are usually the best of three games. This means the first player to win two games wins the match. Before May 2006, players could only win a point on their own serve. But the scoring system was changed in 2006, and now players can earn a point on their own serve and also when their opponent serves (15,18). This study aimed to determine some selected physical performances of badminton players between 10-12 years old.

MATERIALS & METHODS

The survey sample of badminton team, average age who practice 3 days a week during the badminton season, size of 11.20 ± 0.86 years, 148.07 ± 11.39 cm body weight averages; 41.33 ± 5.19 kg, designated as 15 badminton players.

The badminton athletes had an 8-week basic training before the start of the first practice test measurements. After 8 weeks the last test measures changes in motor function in athletes using properties.

Hand-grip Test

The purpose of this test is to measure the maximum isometric strength of the hand and forearm muscles. Handgrip strength is important for any sport in which the hands are used for catching, throwing or lifting. Also, as a general rule people with strong hands tend to be strong elsewhere, so this test is often used as a general test of strength. Equipment required: handgrip dynamometer procedure: The subject holds the dynamometer in the hand to be tested, with the arm at right angles and the elbow by the side of the body. The handle of the dynamometer is adjusted if required - the base should rest on first metacarpal (heel of palm), while the handle should rest on middle of four fingers.

When ready the subject squeezes the dynamometer with maximum isometric effort, which is maintained for about 5 seconds. No other body movement is allowed. The subject should be strongly encouraged to give a maximum effort (3).

Sit and Reach Flexibility Test

The sit and reach test is a common measure of flexibility, and specifically measures the flexibility of the lower back and hamstring muscles. This test is important as because tightness in this area is implicated in lumbar lordosis, forward pelvic tilt and lower back pain (5).

This test was first described and is now widely used as a general test of flexibility. Test Procedure the basic outline of the sit and reach test is described below. Some of the more popular variations are described in more detail above. Equipment required: sit and reach box (or alternatively a ruler can be used, and a step or box). Procedure: This test involves sitting on the floor with legs stretched out straight ahead. Shoes should be removed. The soles of the feet are placed flat against the box. Both knees should be locked and pressed flat to the floor - the tester may assist by holding them down. With the palms facing downwards, and the hands on top of each other or side by side, the subject reaches forward along the measuring line as far as possible. Ensure that the hands remain at the same level, not one reaching further forward than the other. After some practice reaches, the subject reaches out and holds that position for at one-two seconds while the distance is recorded. Make sure there are no jerky movements. See also video demonstrations of the Sit and Reach Test. scoring: The score is recorded to the nearest centimeter or half inch as the distance reached by the hand. Some test versions use the level of the feet as the zero mark, while others have the zero mark 9 inches before the feet. There is also the modified sit and reach test which adjusts the zero mark depending on the arm and leg length of the subject. There are some norms for the sit and reach test and also examples of some actual athlete results. Validity: This test only measures the flexibility of the lower back and hamstrings, and is a valid measure of this. Reliability: The reliability of this test will depend on the amount of warm-up that is allowed, and whether the same procedures are followed each time the test is conducted. Most sit and reach testing norms are based on no previous warm-up, though the best results will be achieved after a warm up or if the test is preceded by a test such as the endurance test which can act as a warm up. If a warm up is used, it

is important to have a standardized warm up and test order and repeat the same conditions for each time the test is conducted (19).

Vertical Jump Test

This procedure describes the method used for directly measuring the vertical jump height jumped. There are also timing systems that measure the time of the jump and from that calculate the vertical jump height. Vertical jump purpose: to measure the leg muscle power equipment required: measuring tape or marked wall, chalk for marking wall (or Vertec or jump mat). Procedure: the athlete stands side on to a wall and reaches up with the hand closest to the wall. Keeping the feet flat on the ground, the point of the fingertips is marked or recorded. This is called the standing reach height. The athlete then stands away from the wall, and leaps vertically as high as possible using both arms and legs to assist in projecting the body upwards. The jumping technique can or cannot use a countermovement (see vertical jump technique). Attempt to touch the wall at the highest point of the jump. The difference in distance between the standing reach height and the jump height is the score. The best of three attempts is recorded (7).

Standing Broad Jump Test

The horizontal jump, also called the standing broad jump, is a common and easy to administer test of explosive leg power. It is one of the fitness test. The horizontal jump was also once an event at the Olympic Games, and is also an event in Sports Hall competitions in the UK. Purpose: to measure the explosive power of the legs equipment required: tape measure to measure distance jumped, non-slip floor for takeoff, and soft landing area preferred. Commercial Long Jump Landing Mats are also available. The take-off line should be clearly marked. Procedure: The athlete stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed (12).

15 m Speed Test

The speed performance of badminton players were measured with a 15 m speed test. A digital photocell were placed in start and finish lines. After warm-up, each subject stood in start line. When they were ready, they started the test. After they passed the start line, photocell begun to record speed time.

Subjects passed the finish line and then, time was stopped by the photocell. Sprint time for 15 m read from the display of the photocell and recorded in seconds. Each subject performed 3 trials and the lowest time was accepted as subject's score. A 3 min rest was given between trials (9,16,17).

Data Analysis

All descriptive data was presented mean \pm standard deviation (Mean \pm SD). The paired t-test was used to compare the pretest and post test scores according to the results of the normality test. Statistical analyses was performed by SPSS 22.0 Statistic Package Program. Statistical significant level was set at 0.05.

RESULT

The research participants age average was 11.20 \pm 0.86 years, body weight average was 41.33 \pm 5.19 kg, height average 148.07 \pm 11.39cm.

Table 1. Age, weight and height values regarding participants .

	N	Mean \pm SD
Age (years)	15	11.20 \pm 0.86
Weight (kg)	15	41.33 \pm 5.19
Height (cm)	15	148.07 \pm 11.39

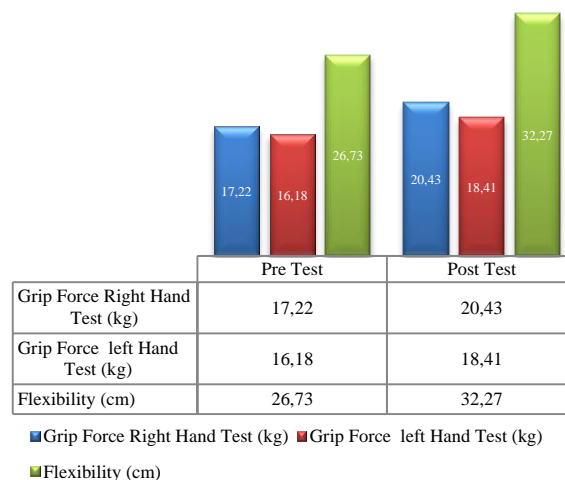


Figure 1. Average of claw strength (right-left) and flexibility measurements of subjects.

In table 2, pre-test and final-test measurements given comparisons between speed test, hand grip strength, horizontal jump, vertical jump and flexibility. This means that vertical jump, flexibility and grip strength (right) hand statistically significant differences were found ($p < 0.05$).

Speed test, hand grip strength (left), horizontal jump preliminary test and in the evaluation of the

final test a statistically significant difference in the comparison could not be identified.

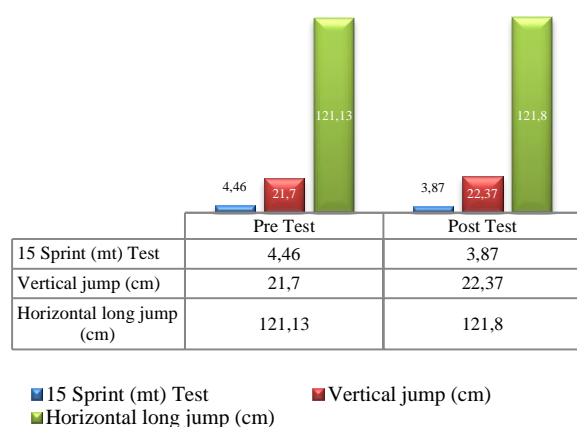


Figure 2. Average of sprint test, vertical jump and horizontal jump measurements of subjects.

DISCUSSION

In the recent study examined physical performances of badminton players in 10-12 aged. Subjects' mean age, body weight and height were 11.20 ± 0.86 years, 41.33 ± 5.19 kg and 148.07 ± 11.39 cm, respectively.

The results of the study revealed that an eight week badminton training improved vertical jump and flexibility performance in the players. On the other hand, the results suggested that 15 m speed, right and left hand-grip strength and horizontal jump performances did not change after the badminton training. Handgrip is related to general strength structure of the body (10,12).

Physical performance in children the growth process should be taken into consideration. From early ages the physical and physiological measurements obtained by football players participating in regular work great importance in terms of showing the developmental levels depending on the results bears.

Pekel et al. reported a mean hand grip strength of 19.8 ± 5.8 kg and a mean hand grip strength of 20.8 ± 6.5 kg for children aged 11-13 years (17). There was a significant difference between the hand-grip strength, horizontal jump and speed parameters between international and national sportsmen (7).

Elasticity is important with sportive performance being important vary in different branches. Gymnastics have high level of flexibility in gymnastics. While it is necessary to be successful in sports branches such as football and basketball, different degrees of flexibility in some athletes may be sufficient. Godges et al. (7) declared that male college running by increased hip flexion and flexibility, extension economy may be developed. According to the study's results, developing of adequate flexibility is a desirable result for proper running performance. Although it could not say that flexibility is most important ability, it has a vital role in some sport branches. Additionally, flexibility is a protection against muscle injuries in addition to a successful performance. It be thought that more studies are needed to make clear of effect of flexibility in athletes despite number of studies on flexibility have conducted.

Table 2. Pre-test and final-test value.

Variables		N	Mean	SD	df	t	p
15 m Sprint Test (sec)	Pre Test	15	4.46	0.77	14	-2.515	0.025
	Final Test	15	3.87	0.61			
Grip force right hand (kg)	Pre Test	15	17.42	3.79	14	-3.522	*0.003
	Final Test	15	20.43	2.36			
Grip force left hand (kg)	Pre Test	15	16.18	3.81	14	-1.431	0.174
	Final Test	15	18.41	4.60			
Vertical jump (cm)	Pre Test	15	21.70	1.76	14	-5.623	*0.000
	Final Test	15	22.37	1.81			
Standing Broad Jump (cm)	Pre Test	15	121.13	5.60	14	-2.197	0.045
	Final Test	15	121.80	5.67			
Flexibility (cm)	Pre Test	15	26.73	5.74	14	-3.923	*0.002
	Final Test	15	32.27	6.70			

*p < 0.05

After 10-week soccer training, it declared that flexibility increases in addition to improvements on 60 m speed, 30 m speed and vertical jump (6,8). A study declared that 30 m speed was 4.15 sec in soccer player and 3.83 sec in badminton players in 10-12 years old. Left hand gripping strength was 15.62 kg in soccer players and 14.68 kg in badminton players. Right hand gripping strength was 17.11 kg for soccer players and 15.21 for badminton players. They declared that soccer players had higher hand grip strength than badminton players in 10-12 years old (10).

Another study explained that dominant hand penalty force was 55.57 kg, and non-dominant handed puck strength was 47.49 kg in tennis players (8). Özer & Kılınç (11) found that athletes in individual sports was higher flexibility than athletes in team sports. Also, they declared that athletes from team and individual sports had similar speed performances.

In conclusion, the results of the study suggest that an 8-week of basic badminton training might improve vertical jump and flexibility except 15 m speed and horizontal jump.

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