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A comparative study on speed and coordinative abilities between lawn tennis and badminton players

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Abstract

Sports is a discipline that studies how the healthy human body works during exercise, and how sport and physical activity promote health and performance from cellular to whole body perspectives. Through the study of science and sport, researchers have developed a greater understanding on how the human body reacts to exercise, training, different environments and many other stimuli. This study is carried out to view the Comparative Study of Speed and Coordinative abilities between Lawn Tennis and Badminton players. For the purpose of this study, 15 (Fifteen) Lawn tennis and 15 (Fifteen) Badminton players were selected as subject. The subjects age ranges between 18-22 years. To determine the speed, 50-yard dash run test will be used and the performance will be recorded in seconds by stop watch. To determine the coordinative abilities, Hand-Eye Coordination test (ball transfer) & Foot-Eye Coordination test was recorded in seconds. The independent t test was used to analyze the data at a 0.05 level of significance using SPSS software20. It shows that speed and coordinative abilities have no significant difference between Lawn Tennis and Badminton players.

Keywords: coordinative abilities, speed, lawn tennis, badminton

1. Introduction

Nowadays sports have become a part and essential of life, millions of fans follow different sports events all over the world with an enthusiasm bordering on devotion. Many people participate in sports and game for fun, happiness, pleasure for health and fitness. Increased participation in sports has resulted in competition which has become an important element of modern life. Competitions provide the means by which one can show's worth by competing successfully- All countries try to show their supremacy over each other for a defeat or success in the international sports competitors. Each and every country develop its own innovation in techniques, tactics and strategies for exhibiting top level performance so as to emerge winners and championships of sports (Frost., R, 1971) ^[1].

The scientific approach by physical education is characterized by profound substantiation of all, its initial prepositional and of the entire process of physical education by the achievement of science and by the inseparable unity of scientific and advanced practice. The traits of this man's nature and the scientific approach to physical combine to make a single entity on the basis of the following principles universality the link with social practice, the comprehensive development of the personality and the efficiency of improvement of public health (Arnold., P, 1972) ^[2].

Sports a part of physical education program has grown so big that it has come to be recognized as a strong social force. Some people claim a separate entity for sports a separate study. The word physical education indicates that physical activity develops the learner. The common denominator in sports and physical education in movement activities, what may not be understood from the combined term is that the motor activities must be performed to never lop the performer or physical education and sports together from a coherent systematic and sound program based on the current accepted principles (Shan Kuku, G.I., 1983) ^[3].

Tennis is a racket sport that can be played individually against a single opponent (singles) and between two teams of two players each (doubles). Each player uses a tennis racket that is strung with the cord to strike a hollow rubber ball covered with felt over or around a net and into the opponent's court.

The object of the game is to play the ball in such a way that the opponent is not able to play a valid return. The player who is unable to return the ball will not gain a point, while the opposite player will ("Tennis Rules: How to play Tennis/ Rules of Sport". www.rulesofsport.com, 2021)^[4].

Since 1890s, tennis rules have changed. Two exceptions are that from 1908 and 1961 the server had to keep one foot on the ground at all times (Goef., M, 2011)^[5], and the adoption of the tiebreak in the 1970s ("Tennis 360: tiebreaks explained". Tennis Australia, 2021)^[6]. In recent addition a system known as Hawk-Eye has been adopted, where electronic review technology coupled with a point challenge system, which allows a player to contest the line call of a point (D'Arcy., M, 2021)^[7].

Tennis is played by millions of recreational players and is also a popular worldwide spectator sport. The four Grand Slam tournaments (also referred to as the "Majors") are especially popular: The Australian Open played on hard courts, Wimbledon played on grass courts, French Open played on Clay courts and US Open played on hard courts ("Grand Slam Tournaments". ITF, 2021).

Badminton is a racket sport played by either two opposing player (single) or two opposing pairs (doubles), who take position on opposite halves of a rectangular court that is divided by a net, players score points by striking a shuttlecock with their racquet so that it passes over the net and lands in their opponent's half of the court. A rally end once the shuttlecock has struck the ground and the shuttlecock may only be struck once by each side before it passes over the net (Bernard., A, 1980)^[8].

The shuttle cock (or shuttle) is a feathered projectile whose unique aerodynamic properties cause it to fly differently from the balls used in most racquet sports; in particular, the feathers create much higher drag, causing the shuttlecock to decelerate more rapidly than a ball. Shuttlecocks have a much higher top speed, when compared to other racquet sports. Because shuttlecock flight is stubbornly affected by wind, competitive badminton is always played indoors. Badminton is also played outdoors as a casual recreational activity, often as a garden or beach game.

(<http://en.wikipedia.org/wiki/Badminton>).

Motor abilities are as inseparable part of sports performance and achievement. The term motor ability has been synonymously used with Physical fitness. Physical fitness of a player depends on the nature of his game and also external conditions. There are a number of fitness motor elements that need to be developed such as speed, endurance, agility, flexibility, power, balance, strength to correct and maintenance of fitness. Badminton and lawn tennis both are almost similar games. A complete badminton player should possess that agility of an acrobat, the power of a race horse, the killer instinct of a panther as well as like a lawn tennis player. Some of the standards the fit player attains to meet the demands of the game are explosive strength, flexibility, power, speed etc., fitness components. Court and field games like badminton, lawn tennis, table tennis, kabaddi, squash, football, volleyball, help in developing strength, flexibility, speed, of the players while other games like boxing, gymnastic, wrestling etc. developing explosive strength and flexibility of its players better.

The concept of 'Motor ability' or Motor fitness as it is often termed is also one exclusive one, through it has been studied extensively over the past several years. Motor fitness is a term that describes an athlete's ability to perform effectively without undue fatigue during sports or other physical activity.

An athlete's motor fitness is a combination of five different components, each of which is essential for high levels of performance. Improving motor fitness involves such as (1) Muscular strength (2) Muscular Endurance (3) Cardio Vascular endurance (4) Flexibility (Suppleness) (5) Power (6) Speed (7) Agility (8) Balance (9) Reaction time.

1.1 Hypothesis of the study

It was hypothesized that there were significance differences in the speed and coordinative abilities between lawn tennis and badminton players.

2. Methodology

In this chapter, the procedure for the sources of data, selection of the subjects, criterion measures, instrument's reliability, tester's competency, collection of data, procedure for administration of tests and statistical procedures employed for the study are described.

2.1 Sources of data

In this study, 15 players of Lawn tennis and Badminton were selected as subjects to compare their selected speed and coordinative abilities who have participated in the national level competition. Hence, these entire subjects were sources of data for this study.

2.2 Selection of subjects

For the purpose of this study, 15 (Fifteen) Lawn tennis and 15 (Fifteen) Badminton players were selected as subject. The subjects age was ranges between 18-22 years. The entire subject is medically fit to participate in the research work.

2.3 Criterion measures

1. To determine the speed, 50-yard dash run test will be used and the performance will be recorded in seconds by stop watch.
2. To determine the coordinative abilities, Hand-Eye Coordination test (ball transfer) & Foot-Eye Coordination test was recorded in seconds.

2.4 Collection of data

The data was collected on different sheet of test. The score of the trial would be recorded and best score was considered as raw score. The necessary marking was complete before the start of the test. The data was collected from 30 male subjects (15 from Lawn tennis and 15 from Badminton players) who have participated in the national level competition.

2.5 Administration of the test

To measure speed and coordinative abilities of the selected subject, the following test was administered.

A. 50-meter Dash Run:

Purpose: To measure speed abilities.

Equipment: Area of desired length, marked with a starting line and a finish line and two stopwatches.

Procedure: After warm-up, the subject will be asked to take position behind the starting line and wait for the signal Ready! Go! it will be ensuring that the command should be audible easily to the subject at the starts line and timers at the finish line. At the command Go! the timers started their respective stopwatches and the subject started their sprint. As soon as the subject crossed the finish line, the respective timers stop their

stopwatch and recorded the time accurate up to 0.01 second. Only one correct trial was permitted. The subject will be asked to restart if he had started before the word Go! or had failed to started quickly as the command “go”.

Scoring: The time elapsed from the start to the instant, subject crossed the finished line, will be the score expressed up to 100th of a second.

B. Hand-eye Coordination Test (Ball transfer)

Purpose: To measure the coordination between hand-eye coordination.

Equipment: Two large boxes (capable of holding more than 5 balls of 10 inches diameter each) and a stopwatch.

Procedure: The tester after giving a demonstration, asks a subject to stand in the middle of two boxes lying at a distance of 15 feet from each other. Five or more ordinary playground balls of 10' diameter is put in the box lying on the left-hand side of the subject. The tester gives the commands Ready, Steady, Go! At the word go! the tester switches on the stopwatch while the subject runs to the box on his left, takes out one ball, runs to the right box, puts the ball in the box, runs back to the left box to take another ball for putting in the right box and repeats the process till the last ball is put in the right box. As soon as the subject puts the last ball in the right box, the tester stops the stopwatch to record the time taken by the subject to transfer all the five or more (up to 10 balls, if the tester wants to measure coordination abilities and speed simultaneously).

Scoring: The subject is given two trails after a slow practice trail. The best timing is the score of the test. However, a variety of scoring has been used by the testers depending upon the variety of ways the ball transfer skill has been tested by the physical educators and coaches. For instances, different teachers have used different size and number of balls and different manners in which the subject is required to deposit the ball (tossing from a specified distance, toss it over a barrier, bounce it in the box, just simple placing). Accordingly scoring has been, correct number of balls transferred (during distance tossing), number of complete correct trails out of given number of trails or the time taken to perform the specified job.

C. Foot-Eye Coordination Test

Purpose: To measure coordination in between eye-foot

Equipment: A stopwatch, sheet with footprints or some markings to guide foot placement in a specified pattern. In the absence of sheet or paper, floor play area may be painted black to indicate foot placement pattern with foot prints or other markings about 12 to 15 inches apart.

Procedure: The tester gives a demonstration to a group of 10 to 15 children with the help of a trained helper. He/ she now asks a subject to hop according to the printed footprints or other marks as quickly as possible. The subject may be allowed two trails after slow practice trail.

Scoring: There are two alternative methods of scoring-either the number of errors committed by the subjects are counted or the time taken may be recorded. In case, the errors are counted, the number of times the subject fails to hit the

indicated foot prints, is recorded, zero is the best score. In case, time is to be recorded, the subject is asked to repeat at the errors that are he/she must start again at the point at which he/she misses footprints. Total time elapsed from the starting to the completion of the test, gives the score pf the test. Best of the two test trials is considered for the final score. In this case, time taken is recorded from the starting to the completion of the test using stopwatch. The distance for this test is 18 feet.

3. Analysis and interpretation of data

The statistical analysis for comparison of shuttle run, sprint, push-up, sit-up and handgrip of National level players of Manipur are presented in this chapter.

Comparison of selected variables i.e. speed and coordinative abilities between Lawn Tennis and Badminton players the comparative t-test has been adopted.

3.1 Statistical Analysis of Data

For the analysis of the data on collected thirty (30) male players, 15 each from Lawn Tennis and Badminton, who had participated in national level from Manipur, descriptive analysis and independent ‘t’ test statistical techniques were employed for finding the difference between the two group (Lawn Tennis and Badminton) means, independently.

3.2 Level of Significance

To test the hypothesis, the level significance was chosen at 0.05 level of confidence, which was considered most adequate and reliable for the purpose of this study.

3.3 Findings

The data was collected on thirty (30) male players, 15 each from Lawn Tennis and Badminton by administering the selected test item on speed and coordination. The results of the analysis of pertaining data have been presented in the following tables.

Table 1: Means comparison of Speed between Lawn Tennis and Badminton players

Variable	Groups	N	M	SD	SEM	df	‘t’
Speed	Lawn Tennis	15	7.13	0.6094	0.1573	28	0.08405
	Badminton	15	7.11	0.6069	0.1567		

Table 1 reveals that the Mean (M) and Standard Deviation (SD) of the Speed of 15 player each from Lawn Tennis and badminton were 7.13 ± 0.6094 and 7.11 ± 0.6069 respectively. In addition, the standard errors of Speed were also found as 0.1573 and 0.1567 respectively. The calculated “t” value of speed is 0.08405, which is smaller than the tabulated ‘t’ values = 2.042 at 0.05 level of significance. So, these can be pronounced as no significant differences in terms of speed.

Table 2: Means Comparison of Coordinative ability (Hand-eye coordination test) between Lawn Tennis and Badminton players

Variables	Groups	N	M	SD	SEM	df	‘t’
Hand-Eye Coordination test	Lawn Tennis	15	34.37	2.24	0.58	28	0.22
	Badminton	15	34.19	2.16	0.56		

Table 2 reveals that the Mean (M) and Standard Deviation (SD) of the Eye-hand coordinative test of 15 players each from Lawn Tennis and Badminton were 34.37 ± 2.24 and 34.19 ± 2.16 respectively. In addition, the standard errors of Hand-Eye coordinative ability test (coordination) were also found as 0.58 and 0.56 respectively. The calculated ‘t’ value

of speed is 0.22, which is smaller than the tabulated 't' values=2.024 at 0.05 level of significance. So, these can be pronounced as no significant differences in terms of Eye-hand coordination test (coordinative abilities).

Table 3: Means Comparison of Coordinative ability (Foot-eye coordination test) between Lawn Tennis and Badminton players

Variables	Groups	N	M	SD	SEM	df	't'
Eye-foot Coordination test	Lawn Tennis	15	19.14	2.47	0.611	28	0.32
	Badminton	15	19.42	2.37	0.637		

Table 3 reveals that the Mean (M) and Standard Deviation (SD) of the Eye-foot coordinative test of 15 players each from Lawn Tennis and Badminton were 19.14±2.47 and 19.42±2.37 respectively. In addition, the standard errors of Foot-Eye coordinative ability test (coordination) were also found as 0.58 and 0.56 respectively. The calculated 't' value of speed is 0.32, which is smaller than the tabulated 't' values=2.024 at 0.05 level of significance. So, these can be pronounced as no significant differences in terms of Eye-foot coordination test (coordinative abilities).

3.4 Analysis of hypothesis

For testing the hypothesis, the levels of significance by 0.05 level of confidence was considered adequate for the purpose of this study. The calculated 't' variable i.e. speeds and coordinative abilities were found less than the tabulated value at degree of freedom 28, there is no significant differences between lawn tennis and badminton players.

4. Discussion and Conclusion

Sports is a discipline that studies how the healthy human body works during exercise, and how sport and physical activity promote health and performance from cellular to whole body perspectives. The study of sports science traditionally incorporates areas of physiology (exercise physiology), psychology (sport psychology), anatomy, biomechanics, biochemistry and bio kinetics. Sports scientists and performance consultants are growing in demand and employment numbers, with the ever-increasing focus within the sporting world on achieving the best results possible. Through the study of science and sport, researchers have developed a greater understanding on how the human body reacts to exercise, training, different environments and many other stimuli. The present study carried out to view the Comparative study of Speed and Coordinative abilities between Lawn Tennis and badminton players.

Both the game requires similar types of playing action like speed, agility, coordination, endurance skills which emphasized offensive and defensive play structure. To develop the fitness, an athlete's need high physical and physiological work capacity and numerous amounts is required for practice. For all sports activities, Motor Fitness is also essential or basic need. It is also related to the ability to meet the demand of the environment specially to preserve, to stand with stress, to assist the fatigue and to process the energy for an abundant life. Motor fitness real really implies more than the ability to do work without much effort, physical fitness and some degree. All these activities not only enhance physical well-being, but also mental effectiveness and personal social adjustment as well. As a result of the new discoveries and invention in this area, numerous physical exercise and practice are added. This study shows the value of speed and coordinative abilities between lawn tennis and badminton players being not significant. This must be due to

both games requiring similar types of physical fitness.

Based on the findings of the study, the relation motor fitness components that no significant differences occurred between Lawn Tennis and Badminton in speed and coordination. It is concluded that no difference was noticed between male lawn tennis and male badminton players. For this purpose, 15 male each of Lawn Tennis and Badminton national players of Manipur were selected randomly as subjects and the age of the subjects was ranged between 18 to 22 years.

In relation to their components of speed and coordination where the subjects involved in similar type of daily routine match practiced.

- The 't' test calculation obtains value 0.08405 for 50m dash test (sec) for speed is less than the both table values 2.021 (0.05 significant level) and 2.704 (0.01 significant level). There was no significant difference of 50m dash test between Lawn tennis and badminton players.
- The 't' test calculation obtains value 0.22 for Eye-hand coordinative ability test (sec) is less than the both table values 2.021 (0.05 significant level) and 2.704 (0.01 significant level). There was no significant difference of Eye-hand coordinative ability test (sec) between Lawn tennis and badminton players.
- The 't' test calculation obtains value 0.32 for Foot-eye Coordinative ability test is less than the both table values 2.021 (0.05 significant level) and 2.704 (0.01 significant level). There was no significant difference of Foot-eye Coordinative ability test (sec) between Lawn tennis and badminton players.

5. Recommendation

5.1 On the basis of the results obtained from this study, the following recommendation are made

- It is recommended that the Comparative study of speed and coordinative abilities between lawn tennis and badminton players. Study programmed is also one of the effective evaluations mean for the sports person.
- The same type of study may be developed with longer duration of study programmed to get better improvement.
- It is also recommended that a similar study may be repeated by selecting subjects to different age, sex and level of achievement other than those employed in the present study.
- To make the study more authentic and valid, the study may be repeated larger samples.

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