

## Differences In Reaction Times Of Players Across Badminton Ball Badminton And Tennis

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Cite this paper as: Dr. Anoop Kumar M. S, Dr. Sebastian K. M, Dr. Lipsy John. L, Javio Jose. M, Uthara U. R, Akhil Thomas, Lisa Rachel Saji, Dr. S. Sujanesh K. Das, Dr. George Abraham (2024) Differences In Reaction Times Of Players Across Badminton Ball Badminton And Tennis. *Frontiers in Health Informatics*, (5), 1297-1305

### **Abstract**

The aim of the study was to compare the inconsistency in reaction time among badminton, ball badminton and tennis players. To achieve the purpose thirty male athletes were selected and who were represented colleges and participated in University competitions for badminton, ball badminton and tennis. Ten players were selected from each game and ages of the subjects were ranged from eighteen to twenty five years. The reaction time was selected as criterion variable. The ruler drop test was used to find out the reaction time and the time was measured in milliseconds. The one way analysis of variance (ANOVA) was used to find out the significant difference, if any among badminton, ball badminton and tennis players on selected criterion variables separately. Whenever the F ratio was

found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. In all cases .05 level of confidence was used to test the significance. The results of the study show that there was a significant difference ( $p \leq .05$ ) that exists among the groups such as badminton, ball badminton and tennis players on reaction time ( $p \leq .05$ ).

*Keywords:* Physical fitness, reaction time, tennis, badminton, ball badminton, players.

## Introduction

Badminton as quickly as modified into regarded as a gradual leisure game; however it has grown into a fast and powerful sports activities sports and one of the Olympic sports for 1992. It's miles a really disturbing recreation. At an elite level, gamers are frequently required to perform at their limits of speed, agility, flexibility, staying strength and energy (www. pinnacle cease sports. com). On pinnacle of all of this, gamers need to maintain an excessive state of awareness that permits you to satisfy the tactical/highbrow demands of coping with their opponents. It's far consequently vital that everybody involved with the present day recreation have to be acquainted with the fitness (physiological) necessities of the game and the way 'Badminton fitness' can be more. With suits lasting as tons as an hour, this disturbing event requires a player to very own a selection of attributes which includes misleading skillful techniques, flexibility, agility and each cardio and anaerobic power (Diana & Kevin, 1991). Competitive tennis game enthusiasts additionally need a combination of fitness traits such as pace, agility and electricity blended with a well-increase cardio fitness in order to gain high degrees of overall performance (Thomson, 2009). An essential problem of tennis basic overall performance is the capability to replicate intermittently muscular stress at immoderate tempo. Checks served the instructor and educate to determine a player's degree of functionality, or their improvement, weaknesses and strengths. those test batteries for sports activities overall performance usually handled the physical health additives like electricity and staying power, or the motor talents components, like pace, agility, energy, or accuracy. Testing facilitates athletes and coaches verify athletic talent and pick out bodily talents and areas in need of development (Malousarisa *et al*, 2007).

High overall performance in sports is the final results of significance and the high-quality of motor movements. Those motor moves require bodily fitness, technique, tactics and physiological development of athletes. Physical fitness essentially depends on the motor health additives i.e. pace energy, persistence, flexibility, coordinative capabilities and buffer capability, electricity reserves and sensible potential of inner organs (Singh and Singh, 2002). An expanded overall performance degree can best be performed via way of operating and education of all essential additives i.e. technique coordination, techniques, physical health and psychological traits (Diana & Kevin, 1991). Court racket video games are particular inside the revel in that they are played in distinctly small region and involve the dealing with of a go back and forth cock and often an put into effect. It requires a high diploma of talent, maneuverability and ordinary frame agility a good way to advantage appropriate courtroom function and compete with one's opponent on both offensive and protective maneuvers (Black. & Roundy, 1994). Participation requires expertise in many bodily abilities and

ordinary overall performance is often relying on an individual's hand physiological characteristics of badminton (Cabello & González-Badillo, 2003). Considering the reality that court video games often contain condition a bout of play at a active fee, a high diploma of anaerobic staying strength and also proper jumping capacity is of remarkable significance (Fleck et al., 1985) health level. However, few studies in the literature have investigated physical.

In sports science, reaction time is the critical, measurable interval between the presentation of an unexpected stimulus and the initiation of a motor response. Reaction time is defined as the period of time that elapses between the occurrence of a stimulus and initiation of movement. It is in sport as the interval between an athlete seeing their opponent's move and responding to it. It can be classified as simple reaction time and complex reaction time (Wood, 2023). The difference between these two types is the number of stimuli the body experiences in order to respond. Imagine a group of athletes standing at the starting block of a sprint. The gunshot is fired, and the athletes start moving. The sound of the pistol is the stimulus, and the first move of the athletes is the response. The time between these two, no matter how small, is the reaction time. Reaction time, in physical fitness, is the time needed to respond consciously to an external stimulus. An important thing to note here is that reaction time must not be confused with reflexes. Reflexes are involuntary. On the other hand, reaction time is when the brain has to process the information. Transmission of stimulation through nervous centers and formation of an executory signal, both of which depend on the motility of nervous processes, it is the longest and quantitatively most diversified parameter determining the general time of reaction. (Osinski, 2003; Mackala & Cych, 2011).

In sports science, reaction time is the important, measurable c programming language among the presentation of a sudden stimulus and the initiation of a motor response. Response time is defined as the time period that elapses between the occurrence of a stimulus and initiation of movement. It's far in game as the interval among an athlete seeing their opponent's move and responding to it. It could be categorized as easy response time and complicated response time (Wood, 2023). The distinction between those sorts is the number of stimuli the frame stories in order to reply. Imagine a collection of athletes standing on the starting block of a dash. The gunshot is fired, and the athletes begin moving. The sound of the pistol is the stimulus, and the primary pass of the athletes is the reaction. The time among these two, irrespective of how small, is the response time. Reaction time, in physical fitness, is the time had to reply consciously to an external stimulus. A critical component to observe here is that response time must no longer be careworn with reflexes. Reflexes are involuntary. Alternatively, reaction time is when the mind has to procedure the records. Transmission of stimulation via frightened facilities and formation of an executory signal, both of which rely upon the motility of nervous processes, it's miles the longest and quantitatively most diversified parameter figuring out the overall time of reaction (Osinski, 2003; Mackala & Cych, 2011).

Researchers have frequently taken up the issue of reaction time and its importance in game, arguing that it depends on the kind of stimulus, a reaction to a visual stimulus calls for a little greater

time than a response to an auditory one: a hundred and fifty-200 ms (milliseconds) for the former and 120-a hundred and sixty ms for the latter. It also relies upon on character houses of the participant's apprehensive and muscular systems, his or her initial alertness of the opponent and contemporary condition (e.g. hunger, drowsiness, tiredness, motivation, mind-set to the performed activities, body temperature). The timespan among the prevalence of the stimulus and initiation of movement also relies upon on such elements as age, intercourse, forms of persona, scientific circumstance or the extent of useful asymmetry (Sozanski et al, 1999; Kochanowicz, 2001). Therefore the present have examined changed into to analyses of response time a number of the racket sport players.

### Materials and Methods

To achieve the purpose thirty male athletes were selected and who were represented colleges and participated in the university level competitions for badminton, ball badminton and tennis. Ten players were selected from each game from the colleges of Calicut University, Kerala. The age of the subjects were ranged from eighteen to twenty four years. The reaction time was selected as criterion variable for this study. The ruler drop test was used to find out the reaction time and the time was measured in milliseconds. This test uses fundamental physics principles discovered by Galileo and refined by Newton. According to Wood (2023), in Exercise Physiology from the University of Western Australia and founder of Top end Sports, the ruler drop test provides a reliable field assessment of neuromuscular response time. The calculation is based on the formula:  $t = \sqrt{(2d / g)}$ . Where:  $t$  = reaction time (seconds),  $d$  = distance fallen (meters),  $g$  = acceleration due to gravity ( $9.8 \text{ m/s}^2$ ). For convenience when measuring in centimeters, we use:  $t = \sqrt{(2d / 981)}$ .

The one way analysis of variance (ANOVA) was used to find out the significant difference, if any among badminton, ball badminton and tennis players on selected criterion variable separately, whenever the F ratio was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. In all cases .05 level of confidence was used to test the significance.

### Results

The significant differences among badminton, ball badminton and tennis players on reaction time was analyzed and presented in table I.

**Table - I**

#### **Analysis of Variance on Reaction Time among Badminton, Ball Badminton and Tennis Players**

	<b>Badminton</b>	<b>Ball Badminton</b>	<b>Tennis</b>	<b>SOV</b>	<b>SS</b>	<b>df</b>	<b>MS</b>	<b>F</b>
Mean	135.4	146.72	154.82	B	2836.45	2	1429.3	23.72*
S.D	5.32	5.61	4.92	W	813.82	27	22.72	

Table-I indicates the mean, standard deviation and F value of reaction time of badminton, ball

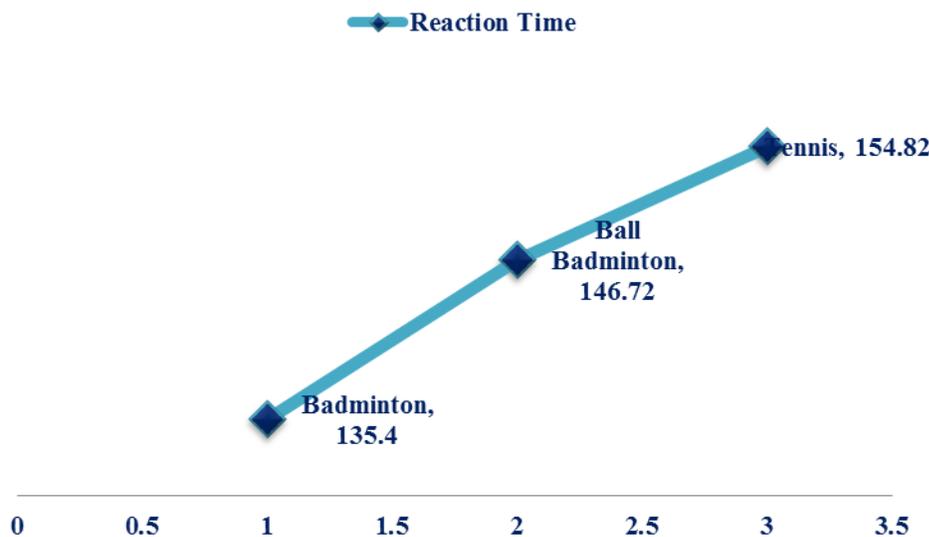
badminton and tennis players. The mean and standard deviation values were 135.4 and 5.32 for badminton, 146.72 and 5.61 for ball badminton and 154.82 and 4.92 for tennis players. The obtained F value for these values was 23.72 which was higher than the table value of 4.21 significant at .05 level of confidence.

**Table - II**  
**Scheffe’s Post Hoc Test for the Difference between Paired Mean on Reaction Time**

<b>Badminton</b>	<b>Ball Badminton</b>	<b>Tennis</b>	<b>MD</b>	<b>CI</b>
135.4	146.72		11.32*	7.74
	146.72	154.82	8.1*	
135.4		154.82	19.42*	

\*Significant at 0.05

The table II shows the required Scheffe’s confidence interval value to be significant at 0.05 level was 7.74, and the mean difference between the badminton and ball badminton players is 11.32, the ball badminton and tennis player is 8.1 and badminton and tennis player is 19.42 respectively. These values are higher than the confident interval value of 7.74, which shows there is a significant difference in reaction time among the groups. The mean of badminton, ball badminton and tennis players on reaction time are graphically presented in figure 1.



**Figure 1: The mean values of badminton, ball badminton and tennis players on Reaction Time**

**Discussion**  
 The result of the study revealed that there was a significant difference in reaction time among badminton, ball badminton and tennis players. Inconsistencies in physical fitness traits among

badminton, ball badminton, and tennis athletes stem from differences in court size, equipment weight, and the tempo of play, requiring specialized rather than universal fitness, according to studies (Sandhu *et al.*, 2017; Richard, 2010). Badminton needs high-intensity anaerobic bursts, even as tennis is predicated extra on aerobic persistence, and ball badminton affords a hybrid requirement depending on court floor (Fernandez *et al.*, 2009). It's vital to have a sure degree of bodily, physiological and anthropometric parameters for racket players (Ashokan & Abraham., 2015; Kafkas *et al.*, 2009). Ooi *et al.* (2009) mounted the physical and physiological attributes of elite and sub-elite Malaysian male badminton players suggesting that at the elite stage tactical information, technical skills, and bodily fitness could be of more importance. Barikosz (2013) explained through his study that the reaction time of badminton players and it can be improved to badminton players compare with others. The result of Vedagnanam & Abraham (2022) is also in association with the result of this study, where they found out that the relationship of reaction time of sprinting and jumping among athletes.

Badminton is a game which may be very in depth in nature, requires jumps and energetic motion on the court docket (Kaplan *et al.*, 2019). The consequences might be attributed due to nature of the game. The period and environment of all 3 sports activities were special. Tennis is an event which is more often than not performed out of doors in high temperature for long period; a tennis match frequently lasts longer than an hour and in some instances greater than 5 hours. Manrique & González-Badillo (2003) studied evaluation of the characteristics of aggressive badminton consequences that badminton is characterized by repetitive efforts of alactic nature and terrific intensity which are constantly completed at some point of the suit. Consequently, this might be the purpose that is attributes better endurance of tennis players (Deng *et al.*, 2023).

Badminton is characterized as the fastest racket game, requiring exquisite anaerobic ability, agility, and explosive strength for vertical jumping and rapid lunging. Ball badminton is performed with a feather-included woolen ball on a bigger courtroom than conventional badminton, requiring a mix of agility and staying power (Rana & Rajpoot, 2015). Tennis is a marathon style game requiring excessive-stage patience for lengthy rallies and fits, mixed with explosive strength for strokes. Tennis players have higher conditioned body than to their counterpart players of badminton players due to their greater participation extra conditioning greater practice (Kiyota *et al.*, 2019). Thomas et al (2023) proved that through their study that the lower body strength is also play a role to improve the movement speed, which is associated with the result of this study. The studies of Chauhan & friend (2022) absolutely mentioning that the rate and reaction time of the racket game players are one-of-a-kind and each game must have its personal skill as properly. The Badminton institution had better speed in comparison to the tennis group (Andrew *et al.*, 2003; Lees, 2003). This investigation show that the reaction time is differed from game to game and the badminton players had better speed and agility compare with ball badminton and tennis players. Wood (2023) clearly found out that the badminton players display shorter reaction times than other game players.

## Conclusion

From the results of the study it was concluded that there was a significant difference between

badminton, ball badminton and tennis players on reaction time. The high frequency and intensity of play for the duration of a fit, together with the excessive maximum and minimal common coronary heart quotes, indicate that badminton is a recreation that, at competition level, demands a high percent of individual aerobic energy and people excessive ranges of cardio power allow gamers to hold this type of effort at some stage in a play time (Panackal & Abraham, 2015). Each tennis and badminton is super racket sports that sell health, coordination, and mental attention, yet they range in tempo, power, and playing environment. Tennis flourishes on endurance, out of doors play, and strategic shot-making, at the same time as badminton shines through pace, agility, and precision in a controlled indoor placing. It was also found that badminton players are better in reaction time when compared to ball badminton and tennis players.

Moreover we can find the ball badminton players are better in reaction time when compare with ball badminton players. The reaction time is very essential for all the racket players to have better performance. This study may the path to understand the difference of reaction ability among the badminton, ball badminton and tennis players. It will be useful to all the racket players, trainers and spots scientist to refer in their future assignments.

#### **Conflict of Interest**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

#### **Acknowledgements**

No external funding supported this study. The results of this study are presented clearly, honestly and without fabrication, falsification or inappropriate data manipulation.

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