

RESEARCH PAPER

Inconsistencies in Physical Fitness Traits Among Athletes of Badminton Ball Badminton and Tennis

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ABSTRACT

The purpose of the study was to compare the inconsistency in speed and agility 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 four years. The speed and agility were selected as criterion variables. The speed was measured by using 50m run and the agility was measured by using shuttle run. 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 speed ($p \leq .05$) and agility ($p \leq .05$).

Keywords: Physical fitness, speed, agility, tennis, badminton, ball badminton, athletes.

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INTRODUCTION

Physical fitness is the frame's capacity to characteristic successfully, permitting individuals to carry out day by day duties, paintings, and entertainment sports without undue fatigue (www.google.com/search?q=bodily+fitness). The identification of physical traits in a sport modality contributes to its fulfillment and enables to identify differences amongst athletes of various modalities that are of remarkable hobby for both recreation coaches and scientists. Sports activities overall performance is based in a complex and intricate diversity of variables, which consist

of bodily (trendy and precise situations), psychological (character and motivation) and body (frame morphology, anthropometry and body composition) elements. Research have talked about the importance of physical traits for special sports activities consisting of volleyball (Duncan *et al.*, 2006), rugby (Gabbett, 2002), basketball (Cesar, 2005), psychological perception (Bindu *et al.*, 2026) and achievement motivation (Sebastian *et al.*, 2024). Tests served the teacher and educate to determine a player's stage of capability, or their development, weaknesses and strengths. Those take a look at batteries for sports activities

overall performance typically handled the bodily health components like strength and patience, or the motor abilities components, like velocity, agility, strength, or accuracy. Testing helps athletes and coaches verify athletic talent and identify bodily talents and regions in need of improvement (Malousarisa *et al*, 2007).

The converting nature of game needs higher talent and expanded physical capabilities. It is a recognized reality that gamers have to be higher in morphological measures, body composition, motor fitness additives and physiological developments. Court racket games are particular in the experience that they're played in incredibly small vicinity and involve the coping with of a commute cock and often an implement. It calls for a high diploma of talent, maneuverability and overall body agility which will benefit appropriate court role and compete with one's opponent on both offensive and defensive maneuvers. Information has been produced for lots elite man or woman and group recreation athletes for bodily and physiological characteristics, together with standing vertical soar scores, associated with particular sports activities performance (Black. & Roundy, 1994; Latin, *et al.*, 1994; Sawula, 1991). Participation requires understanding in many bodily skills and overall performance is frequently depending on an individual's hand physiological characteristics of badminton (Cabello & González-Badillo, 2003). Choice of the great gamers in a group is performed from subjective observation of gambling overall performance at some stage in choice trials. In addition their overall performance in the beyond years turned into also mentioned and then the final team becomes decided on. Speedy beginning, stopping, dodging, darting and acceleration are the essential necessities to a terrific court play. Considering the fact that courtroom video games often contain circumstance a bout of play at a lively price, a high degree of anaerobic staying power and also true jumping ability is of top notch significance (Fleck *et al.*, 1985, Panackal *et al*, 2012) health level. However, few studies inside the literature have investigated bodily.

High overall performance in sports is the outcome of significance and the fine of motor movements. Those motor moves require bodily health, technique, approaches and physiological improvement of athletes. Bodily fitness essentially depends on the motor health additives i.e. pace power, patience, flexibility, coordinative abilities and buffer capacity, electricity reserves and practical capacity of inner organs. Although the ratio differs from game to game but certain quantity of a lot of these qualities are the vital prerequisite for any motor movement (Singh and Singh, 2002). The growing dispositions in international sport, mainly in team games are diagnosed as the boom in recreation pace, more difficult body game and greater variability in technique and procedures. An expanded overall performance level can most effective be carried out by way of working and schooling of all major additives i.e. method coordination, techniques, bodily fitness and psychological traits (Diana & Kevin, 1991).

Badminton as soon as changed into seemed as a slow recreational sport, but it has grown into a fast and powerful sports activities and one of the Olympic activities for 1992. It is an incredibly demanding sport. At an elite level, players are regularly required to perform at their limits of speed, agility, flexibility, staying power and electricity. On top of all of this, players need to preserve a high kingdom of concentration that allows you to meet the tactical/intellectual demands of handling their opponents. The various ability stresses of aggressive play are considerable. It's far consequently essential that everyone involved with the current game have to be acquainted with the fitness (physiological) requirements of the game and how 'Badminton health' can be greater. With fits lasting as much as an hour, this worrying event requires a participant to own an expansion of attributes such as misleading skillful techniques, flexibility, agility and each cardio and anaerobic electricity (Diana & Kevin, 1991). Competitive tennis gamers also want an aggregate of fitness characteristics inclusive of pace, agility and energy combined with a properly-increase cardio health which will gain high stages of performance (Thomson, 2009). A crucial problem of tennis overall performance is the capability to copy intermittently muscular pressure at excessive pace. Despite the fact that, the closing practical overall performance of any complicated chain of torque transfers (i.e., serves or ground strokes in tennis) relies upon on numerous factors such as method, flexibility, muscle electricity, velocity, and strength. Consequently the present have a look at changed into to analyses of velocity and agility a few of the racket game 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 MG University, Kerala. The age of the subjects were ranged from eighteen to twenty four years. The speed and agility were selected as criterion variables for this study. The speed was taken in seconds and measured by using 50m run and the agility was taken in seconds and measured by using shuttle run (10m x 4 times). 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.

RESULTS

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

Table – I: Analysis of Variance on Speed among Badminton, Ball Badminton and Tennis Players

	Badminton	Ball Badminton	Tennis	SOV	SS	df	MS	F
Mean	7.93	8.82	8.33	B	20.27	2	10.31	48.29*
S.D	0.31	0.29	0.27	W	2.18	27	0.07	

Table-I indicates the mean, standard deviation and F value of speed of badminton, ball badminton and tennis players. The mean and standard deviation values were 7.93 and 0.31 for badminton, 8.82 and 0.29 for ball badminton and 8.33 and 0.27 for tennis players. The obtained F ratio for these values was 28.29 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 Speed

Badminton	Ball Badminton	Tennis	MD	CI
7.93	8.82		0.89*	0.37
	8.82	8.33	0.49*	
7.93		8.33	0.4*	

*Significant at 0.05

The table II shows the required Scheffe’s confidence interval value to be significant at 0.05 level was 0.37, and the mean difference between the badminton and ball badminton players is 0.89, the ball badminton and tennis player is 0.49 and badminton and tennis player is 0.4. These values are higher than the confident interval value of 0.37, which shows there is a significant difference in speed among the groups. The significant differences among badminton, ball badminton and tennis players on agility was analyzed and presented in table III.

Table-III: Analysis of Variance on Agility among Badminton, Ball Badminton and Tennis Players

	Badminton	Ball Badminton	Tennis	SOV	SS	df	MS	F
Mean	11.14	12.73	11.91	B	23.71	2	12.41	22.8*
S.D	0.37	0.39	0.35	w	7.62	27	0.31	

Table-III shows the mean, standard deviation and F value of agility of badminton, ball badminton and tennis players. The mean and standard deviation values were 11.14 and 0.37 for badminton, 12.73 and 0.39 for ball badminton and 11.91 and 0.35 for tennis players. The obtained F value for these values was 22.8, which was higher than the table value of 4.21 significant at .05 level of confidence.

Table- IV: Scheffe’s Post Hoc Test for the Difference between Paired Mean on Agility

Badminton	Ball Badminton	Tennis	Mean difference	CI
11.14	12.73		1.59*	0.72
	12.73	11.91	0.82*	
11.14		11.91	0.77*	

The table IV shows the required Scheffe’s confidence interval value to be significant at 0.05 level was 0.72. The mean difference between badminton and ball badminton players is 1.59, the ball badminton and tennis player is 0.82 and the badminton and tennis player is 0.77. These values are higher than the confident interval value of 0.37, which shows there is a significant difference in agility among the groups. The mean of badminton, ball badminton and tennis players on speed and agility are graphically presented in figure 1 and 2.

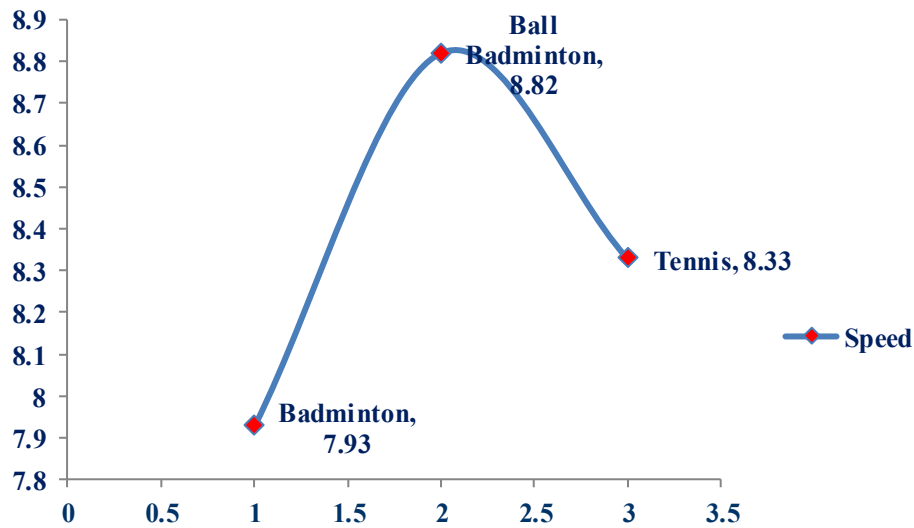


Figure 1: The mean values of badminton, ball badminton and tennis players on Speed

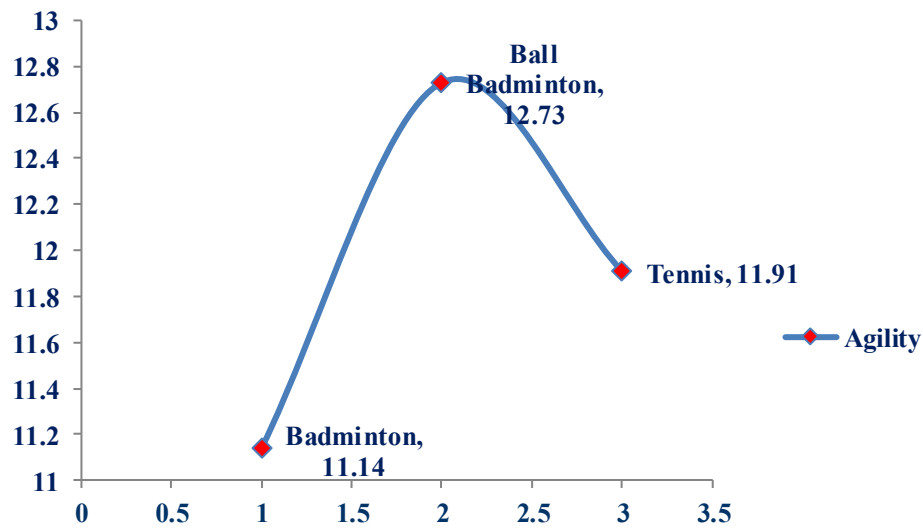


Figure 2: The mean values of badminton, ball badminton and tennis players on Agility

DISCUSSION

The result of the study revealed that there was a significant difference in speed and agility 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; Tyagi et al., 2025; Raut et al., 2024). Competitive tennis players additionally want a mixture of fitness characteristics such as velocity, agility and power blended with a properly-expand cardio fitness with the intention to attain high stages of overall performance (Kovacs, 2007; Abraham et al., 2012; Kumar et al., 2025). It's miles vital to

have a sure degree of bodily, physiological and anthropometric parameters for racket players (Kafkas et al., 2009; Shafeeq et al., 2010; Tyagi et al., 2026). 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.

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. Throughout a healthy there is a combination of periods of maximal or near maximal paintings and longer periods of moderate and low remaining hardly for one hour. 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). The opposite results may owe because of the depth, efforts and demand of the game. 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). Strength training is also an important factor to important to improve the strength of the lower extremities body for the racket athletes and it will improve the performance also (Asaithambi *et al.*, 2012; Sankaranarayanan *et al.*, 2011; Abraham, 2010)

Badminton is characterized as the fastest racket game, requiring exquisite anaerobic ability, agility, and explosive strength for vertical jumping and rapid lunging (Sukumar *et al.*, 2012; Abraham, 2014). 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). The studies of Chauhan & friend (2022) absolutely mentioning that the rate and agility of the racket game players are one-of-a-kind and each game must have its personal skill as properly. The study results of Sukumar *et al* (2012) and Ashokan & Abraham (2015) clearly found out that the speed is very important for improving the skill of any game. The Badminton institution had better speed in comparison to the tennis group (Andrew *et al.*, 2003; Lees, 2003). This investigation show that the speed and agility are differed from game to game and the badminton players had better speed and agility compare with ball badminton and tennis 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 speed and agility. From these results, we are able to conclude that badminton is based totally on fast moves, with a high-quality demand on the lactic anaerobic gadget and, to a lesser degree, on the lactic anaerobic metabolism. 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 speed and agility when compared to ball badminton and tennis players.

Moreover we can found the tennis players are better in speed and agility when compare with ball badminton players. The both motor skills speed and agility is very essential for all the racket players to have better performance. This study may the path to understand the difference of speed and agility 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.

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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.

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