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Comparison of selected physical fitness components between badminton and handball athletes

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Abstract
The aim of this study was to distinguish between handball and badminton players based on selected physical fitness components. A total of 50 male players, comprising 25 badminton and 25 handball male inter-university players of University of Lucknow participated in the study. The physical fitness variables under investigation included speed, agility, and explosive strength.
Data analysis was conducted using SPSS Software, employing measures such as arithmetic mean, standard deviation, standard error of mean, and t-test for comparisons. For explosive strength, badminton players recorded mean and SD values of 26.37 and 1.52, while b handball players displayed values of 29.33 and 1.58. The t-value of 6.78 suggested a noteworthy difference in explosive strength between the two groups.
The mean and standard deviation values for speed in badminton players were 7.43 and 0.46, respectively, while handball players exhibited mean and SD values of 6.76 and 0.44. The resulting t-value was 5.3, indicating a significant difference in speed between the two groups.
Regarding agility, badminton players demonstrated mean and SD values of 10.5 and 1.9, whereas handball players showed values of 8.9 and 0.67. The t-value of 6.24 signified a significant disparity in agility between the two sets of players.
Overall, significant differences were observed between badminton and handball players in relation to explosive strength ($t = 6.78$, $p < .05$). Speed ($t = 5.3$, $p < .05$), agility ($t = 6.24$, $p < .05$).

Keywords: Badminton, handball, speed, agility, explosive strength

Introduction
Engaging in physical activity is a vital component for maintaining overall well-being. It promotes sustained vitality and a heightened sense of well-being. Various individuals hold diverse perspectives on physical fitness. According to experts, the optimal functioning of physiological systems defines physical fitness. In essence, physical fitness is a broad term with multifaceted significance. For an average person, it signifies the capacity to perform routine tasks without experiencing fatigue or strain. Moreover, it entails having the energy to engage in additional activities
In earlier eras, the assessment of physical fitness underwent diverse perspectives and was appraised through various methodologies. The genesis of physical well-being, rooted in military or athletic objectives, has endured for centuries, tracing back to ancient Chinese and Athenian civilizations.
The goal is to maintain optimal physical well-being, ensuring the capability to perform everyday tasks, participate in recreational activities, and respond to emergencies as they arise. In essence, an individual's physical fitness is influenced by their enthusiasm for vigorous activities. This aspect of fitness varies among individuals, workplaces, and evolves over time and circumstances. It is currently a topic of discussion regarding how to uphold the standard of ideal fitness. From a physiological standpoint, physical fitness can be described as the body's ability to undertake and recover from strenuous exercise.
The proficiency in sports significantly relies on these capabilities. Physical fitness is indispensable for individuals in every facet of life, with levels varying from an average person to that of a global athlete. Greater emphasis should be placed on the physical well-being of individuals. The strength of a nation is truly fortified only through the physical fitness and health of its people. Physical fitness encompassed the comprehensive set of five motor capacities: speed, strength, endurance, flexibility, and coordination abilities. These qualities, along with their intricate manifestations such as strength, endurance, maximum strength,

explosive strength, maximum speed, and agility, constituted the fundamental prerequisites for human motor skills.

Objective

The aim of this study is to compare physical fitness elements, specifically speed, agility, and explosive strength, among male inter-university players of handball and badminton represented the University of Lucknow.

Methodology

To conduct this study, a total of 50 male players were chosen, comprising 25 handball and 25 badminton inter-university players from the University of Lucknow. The physical fitness variables under investigation include speed, agility, and explosive strength. Data collection involved the application of tests such as the 50-yard dash, shuttle run, and standing broad jump. The collected data underwent analysis using SPSS Software, employing statistical measures such as arithmetic mean, standard deviation, standard error of mean, and t-test for comparison.

Result

To analyze the outcomes, we employed mean and standard deviation. The mean and standard deviation of the chosen dimensions for both handball and badminton players were calculated, and the results are presented in the subsequent tables.

Table 1: Descriptive and comparative table of handball and badminton players in relation to Agility

Group	N	Mean	S.D.	S.D. Error	p-value	t-value
Handball	25	8.9	0.67	0.13	.000	6.24*
Badminton	25	10.5	1.19	0.24		

Table 1 discloses the mean and standard deviation figures for the agility of handball and badminton players. Specifically, Badminton players displayed mean and standard deviation values of 10.5 and 1.19, respectively. In contrast, handball players exhibited mean and standard deviation values of 8.9 and 0.67, with a corresponding t-value of 6.24.

Table 2: Descriptive and comparative table of handball and badminton players in relation to Explosive strength

Group	N	Mean	S.D.	S.D. Error	p-value	t-value
Handball	25	29.33	1.58	0.32	.000	6.78*
Badminton	25	26.37	1.52	0.30		

Table 4 presents the mean and standard deviation metrics for the explosive strength of handball and badminton players. Specifically, Badminton players demonstrated mean and standard deviation values of 26.369 and 1.52, respectively. In parallel, handball players exhibited mean and standard deviation values of 29.332 and 1.58, with a corresponding t-value of 6.78.

Table 3: Descriptive and comparative table of handball and badminton players in relation to speed

Group	N	Mean	S.D.	S.D. Error	p-value	t-value
Handball	25	6.76	.44	0.09	.000	5.3*
Badminton	25	7.43	.46	0.10		

Table 3 illustrates the mean and standard deviation measurements for the speed of handball and badminton players. Specifically, Badminton players exhibited mean and standard deviation values of 7.43 and 0.46, respectively. Meanwhile, handball players demonstrated mean and standard deviation values of 6.76 and 0.44, with a corresponding t-value of 5.3.

Discussion

The mean and standard deviation measurements for agility in Badminton and Handball players were 10.5 & 1.19 and 8.9 & 0.67, respectively, with a t-value of 6.24. The results indicate a significant difference between Badminton and Handball players concerning agility. This discrepancy is attributed to the specific demands of Handball, where players require exceptional speed and agility for swift movements during the game**.**

For the comparison of explosive strength, the mean and standard deviation values for Badminton and Handball players were documented as 26.37 & 1.52 and 29.33 & 1.58, respectively, with a t-value of 6.78 indicating a significant difference between the two groups. The results suggest that Handball players exhibit greater explosive strength compared to Badminton players. This is attributed to the inherent need for good explosive strength in Handball, where quick bursts of power are essential for optimal performance.

In the context of speed, the mean and standard deviation values for Badminton and Handball players were 7.43 & 0.46 and 6.76 & 0.44, respectively, with a t-value of 5.3 indicating a significant difference between the two groups. This discrepancy underscores that Handball players exhibit greater speed compared to Badminton players. Given that Handball is renowned as one of the fastest-paced sports, players in this category necessitate excellent speed for enhanced performance during matches.

Conclusions

Significant difference was found between badminton and Handball players in compare to explosive strength (t =6.78, p<.05).Significant difference was found between badminton and Handball players in relation to speed (t = 5.3, p<.05). Significant difference was found between badminton and Handball players in compare to agility (t = 6.24, p<.05). Initially it was hypothesized that there will be no significant difference between badminton and Handball l players in comparison to speed, agility, explosive strength is not accepted at 0.05 level of significant.

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