



Game Analysis of Scoring Strokes in Men's Singles and Men's Doubles Badminton

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Abstract

Background: Badminton requires a combination of technical skills, tactical awareness, and physical endurance. The differences between singles and doubles play influence the strategies and stroke selection of players. This study aims to analyze the effectiveness of different strokes in scoring points in men's singles and doubles badminton, as well as to determine the contribution of each stroke to scoring performance. **Methods:** A descriptive comparative research design was used, focusing on game analysis. The study involved 8 randomly selected active players from a population of 30 members of the UPI Badminton Club. Data were collected through match simulations consisting of 8 sets, with stroke occurrences recorded using a sign system method. Statistical analysis was conducted using the Independent Sample T-Test or Mann-Whitney U Test based on data normality. **Results:** The findings indicate that Smash Shot, Drive Shot, and Cut Drop Shot had significant differences in effectiveness between singles and doubles ($p < 0.05$). In contrast, Drop Shot, Net Shot, Clear Shot, Jump Smash Shot, Cut Smash Shot, and Net Kill Shot did not show significant differences ($p > 0.05$). **Conclusion:** The results highlight the need for different training approaches for singles and doubles players. Singles players should optimize strokes that enhance control and endurance, while doubles players should focus on quick and coordinated shot execution. This study provides valuable insights for coaches and athletes to develop more effective training strategies based on game format-specific demands.

Keywords: badminton, game analysis, stroke techniques, playing strategy, scoring.



Introduction

Badminton is a sport that requires a combination of technical skills, tactical awareness, and physical endurance (Faude et al., 2009; Milon, 2014). The differences between singles and doubles matches influence the playing styles, strategies, and techniques used by athletes (Alcock & Cable, 2009). In men's singles, players must cover the entire court independently, requiring them to develop endurance, precise shot placement, and a variety of stroke techniques (Armstrong et al., 2023; Morgans et al., 1987). On the other hand, men's doubles rely on teamwork, quick reflexes, and specialized shot selection to optimize court coverage and counter opponents' strategies (Armstrong et al., 2023; Terry et al., 1996).

Understanding the technical differences between singles and doubles play is crucial for improving training methodologies, optimizing performance, and guiding player development. Additionally, researchers have developed models to identify significant shots and their influence on rally outcomes, incorporating both technical and contextual variables (Sheng et al., 2022; Wang et al., 2022). With the increasing competitiveness in university-level badminton, a deeper insight into effective scoring strokes is necessary to enhance player performance. Despite numerous studies on general badminton techniques, there is still a gap in research specifically addressing scoring strokes and their impact in different playing formats.

Previous studies have highlighted variations in movement patterns and stroke execution between singles and doubles players. Singles players exhibit higher heart rates, take more steps, and move at higher velocities compared to doubles players (Alcock & Cable, 2009; Morgans et al., 1987). In badminton, singles play involves more shots to the extreme fore- and rear-court, while doubles feature a greater diversity of shots (Alcock & Cable, 2009). Tennis movement patterns reveal distinct sequences, with split steps as initial movements, followed by side steps and strides to reach the ball, and strides and side steps for recovery (Hughes & Meyers, 2005). A dynamical systems perspective in badminton reveals in-phase and anti-phase patterns of player movements, with speed scalar product serving as a potential collective variable to distinguish cooperative and competitive play (Chow et al., 2014). However, these studies did not specifically examine the most effective strokes in scoring points, making this research essential to bridge the existing knowledge gap.

This study offers a novel perspective by focusing on game analysis to determine which

strokes are most effective in scoring points. Unlike prior research that mainly emphasized general stroke mechanics or tactical approaches, this research provides empirical data on scoring efficiency in different game formats. By employing video analysis and statistical methods, this study contributes new insights to badminton performance optimization.

The findings of this research will be beneficial for coaches, athletes, and sports educators in refining training regimens and tactical strategies. By identifying which strokes contribute most to scoring points, this study can help optimize skill development programs tailored for both singles and doubles players. Furthermore, this research will serve as a reference for future studies in the field of sports science and badminton performance analysis.

Research Objectives

1. To analyze the frequency and effectiveness of different strokes used in men's singles and men's doubles badminton at UPI Badminton Club.
2. To compare the scoring efficiency of strokes between singles and doubles players.
3. To provide recommendations for training programs based on the findings.

Methods

Design and Methods

This study employs a descriptive comparative research design, which aims to analyze and compare scoring strokes between men's singles and men's doubles players. Descriptive research is used to collect and analyze ongoing events, while comparative research compares different variables—in this case, stroke techniques leading to scoring.

The primary variable in this study is badminton stroke techniques. The research design focuses on analyzing the characteristics of stroke techniques in men's singles and men's doubles play through game analysis.

Participants

The participants in this study are active members of the UPI Badminton Club who have consistently trained for the past year. The selected participants are male players willing to participate in simulated games, with each game consisting of 8 sets. A total of 8 players were randomly selected from the club's population.

The study population consists of all male badminton players at the UPI Badminton Club, totaling 30 individuals. The research sample was selected using a simple random sampling technique, ensuring each member had an equal chance of being chosen. This method was

employed to obtain a representative sample of 8 players, allowing for an unbiased comparison between singles and doubles performances.

Instrument

The primary instrument used in this study is the sign system method, where observations are recorded using tally marks on a scoring sheet. The scoring sheet, adapted from Rahmi (2014) and Brahms (2010), categorizes different stroke techniques and their contributions to scoring points. This method ensures systematic data collection by tracking each successful stroke leading to a score.

Procedure

The study was conducted in several stages. First, the research problem was formulated to identify key questions regarding stroke effectiveness in singles and doubles play. Next, a descriptive comparative approach was selected to analyze and compare the effectiveness of different strokes.

The research instruments were then determined, with a sign system employed to systematically record scoring strokes. The study population, consisting of active male players at the UPI Badminton Club, was identified, and a random sampling method was used to select 8 participants.

Data collection was carried out through match simulations, with each game consisting of 8 sets. During these simulations, all strokes leading to a score were recorded for analysis. Finally, the collected data were processed and analyzed to compare stroke effectiveness between singles and doubles play, providing insights into optimal techniques for scoring points.

Data Analysis

The collected data were analyzed using statistical methods to determine scoring stroke effectiveness. The normality of the data was first tested. If the data followed a normal distribution, the Independent Sample T-Test was used to compare singles and doubles stroke efficiency. If

the data were not normally distributed, the Mann-Whitney U test was applied. The confidence level for statistical analysis was set at 95% ($\alpha = 0.05$). All analyses were performed using SPSS 21.

This structured approach ensures the reliability and validity of the findings, contributing to a deeper understanding of scoring stroke effectiveness in men's singles and men's doubles badminton.

Result

The analysis of scoring strokes in men's singles and men's doubles badminton at UPI Badminton Club focused on the effectiveness of different stroke techniques. The study recorded the frequency and impact of each stroke type to determine their contribution to scoring points.

Table 1 presents the statistical results for each stroke type, including the T-value, significance level (Sig. 2-tailed), and whether the difference is statistically significant.

The hypothesis testing was conducted using the Independent Sample T-Test to determine whether there were significant differences in scoring stroke effectiveness between singles and doubles players. The decision criteria were based on a significance level of $\alpha = 0.05$.

The analysis revealed significant differences in the effectiveness of specific strokes between singles and doubles matches. The smash shot demonstrated a statistically significant difference ($p = 0.041$), suggesting that its execution and impact vary depending on the format of play. Similarly, the drive shot ($p = 0.016$) showed a significant distinction, indicating that players employ this technique differently in singles compared to doubles. Additionally, the cut drop shot ($p = 0.027$) exhibited a meaningful difference, reinforcing the notion that stroke selection is influenced by the tactical demands of each match type.

Table 1. Descriptive Statistics

No	Stroke Technique	t	Sig. (2-tailed)
1	Smash Shot	-2.252	0.041
2	Drop Shot	1.735	0,084
3	Net Shot	0.000	1.000
4	Drive Shot	-2.750	0.016
5	Clear Shot	-1.141	0,189
6	Jump Smash Shot	-1.655	0,083
7	Cut Smash Shot	-1.414	0,124
8	Net Kill Shot	-2.252	0.073
9	Cut Drop Shot	-2.213	0.027

*Significance

On the other hand, several other strokes, including the drop shot, net shot, clear shot, jump smash shot, cut smash shot, and net kill shot, did not show statistically significant differences ($p > 0.05$) between singles and doubles play. This suggests that these strokes are utilized with relatively similar effectiveness across both match formats.

Discussion

The findings of this study align with previous research highlighting the differences in stroke execution between singles and doubles play. According to (Phomsoupha & Laffaye, 2020), singles players tend to prioritize endurance and precise shot placement, whereas doubles players focus on aggressive, fast-paced exchanges requiring quick reflexes. Male singles players show higher cardiopulmonary endurance, while male doubles players demonstrate superior strength and agility. Doubles disciplines generally have lower work-to-rest ratios, with men's and mixed doubles characterized by shorter rally times and higher shot frequencies (Gawin et al., 2015). This is consistent with our findings, where Drive Shot and Smash Shot were significantly more effective in doubles play, supporting the notion that doubles play emphasizes speed and power over sustained rallies.

Furthermore, the effectiveness of Cut Drop Shot in singles play reinforces the findings of (Cabello Manrique & González-Badillo, 2003), who stated that controlled strokes like drop shots are more advantageous in singles, where maintaining court control and disrupting the opponent's positioning are crucial strategies. The stroke performance relevance (SPR) method reveals that deeper and closer-to-sideline shots yield better scores across court surfaces in men's single match (Liu et al., 2022). Skilled players intentionally disguise backhand drop shots by using exaggerated shoulder rotation and forward body movement, making their shots less predictable (Iwatsuki et al., 2016). The lack of significant differences in strokes such as Clear Shot and Net Shot suggests that these techniques hold similar strategic value across both formats, further supporting research by (Abián et al., 2014), which indicated that clear shots are essential for both defensive and attacking transitions. The overhead defensive clear, in particular, is an essential skill for beginners to master (Alkhalwaldeh & Altarawneh, 2023). Research has shown that the clear is one of the most frequently used shots in international competitions, along with lifts and net shots (Lee et al., 2005). To improve clear shot technique, visual search feedback has been found to be effective, with

players showing significant improvement after incorporating visual search ability exercises into their training (Xiao & Tasnaina, 2025).

These results provide crucial insights for training strategies, as they highlight the necessity for singles players to refine endurance-based techniques while doubles players must enhance reaction speed and teamwork in executing aggressive strokes.

Conclusion

Based on the data analysis, this study demonstrates that there are significant differences in the effectiveness of certain stroke techniques between men's singles and men's doubles at the UPI Badminton Club. Statistical tests revealed that Smash Shot, Drive Shot, and Cut Drop Shot showed significant differences in their contribution to scoring performance in both game formats.

In contrast, Drop Shot, Net Shot, Clear Shot, Jump Smash Shot, Cut Smash Shot, and Net Kill Shot did not exhibit significant differences, indicating that their effectiveness remains relatively consistent across singles and doubles matches.

These findings provide valuable insights for coaches and players in developing more effective training strategies. Singles players should focus on shot accuracy and endurance, whereas doubles players should enhance reaction speed and coordination for dynamic strokes such as Drive Shot and Smash Shot.

Thus, this study contributes to the development of more specialized training methods tailored to the distinct demands of singles and doubles play. It also serves as a reference for performance analysis in badminton, helping to optimize player development and game strategies.

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