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Comparison of Selected Motor Fitness Components Between Wushu and Taekwondo Players of Manipur

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Abstract

Background: The urgency of this study lies in understanding differences in motor fitness characteristics between two combat sports that require high physical performance.
Aims: This study aimed to compare selected motor fitness components, namely power and speed, between Wushu and Taekwondo players of Manipur.
Methods: A total of 40 male state-level athletes aged 18–23 years participated in this study, consisting of 20 Wushu players and 20 Taekwondo players. The research employed a comparative research design. Power was measured using the standing broad jump test, while speed was assessed through a 50-meter dash run. Each participant was given three trials for each test, and the best performance was recorded for analysis. The collected data were analyzed using descriptive statistics and an independent t-test with a significance level set at 0.05, utilizing IBM SPSS version 20.
Result: The results revealed that there was no significant difference in power between Wushu and Taekwondo players. However, a significant difference was found in speed, indicating that Wushu players demonstrated superior speed performance compared to Taekwondo players. The purpose of this study was to compare selected motor fitness components between Wushu and Taekwondo players of Manipur. A total of 40 male athletes, comprising 20 Wushu players and 20 Taekwondo players, were selected as participants. Power and speed were assessed using the standing broad jump test and the 50-meter dash run test, respectively. Independent samples t-test was employed to analyze the data.
Conclusion: The results revealed no significant difference in power between Wushu and Taekwondo players, while a significant difference was observed in speed, favoring Taekwondo players. These findings indicate that sport-specific training characteristics may influence speed development in combat sports. The results provide practical insights for coaches in designing targeted training programs for Wushu and Taekwondo athletes.

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INTRODUCTION

Physical fitness plays an essential role in maintaining health, enhancing physical performance, and supporting daily activities. In modern society, technological advancements and lifestyle changes have significantly reduced levels of physical activity, leading to an increased prevalence of obesity, cardiovascular disease, and other lifestyle-related health problems (Dimitriadis et al., 2025; Malm et al., 2019). Consequently, physical exercise and structured training programs have become increasingly important, particularly in the field of sports and physical education. Physical fitness is considered a fundamental requirement for performing physical tasks effectively and efficiently and remains one of the primary objectives of physical education programs.

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In the context of sports performance, physical fitness is closely related to motor fitness. Although the terms physical fitness and motor fitness are often used interchangeably, they represent different concepts. Physical fitness generally refers to health-related components such as muscular strength, muscular endurance, cardiovascular endurance, and flexibility, whereas motor fitness is a broader concept that includes both health-related and skill-related components such as power, speed, agility, balance, and reaction time (Denysschen et al., 2021; Farley et al., 2020). Motor fitness reflects an athlete's ability to perform sport-specific movements efficiently and successfully and is strongly associated with neuromuscular coordination and motor control.

Motor fitness is considered a crucial determinant of athletic performance, particularly in competitive sports. High levels of motor fitness enable athletes to execute technical skills effectively, maintain performance intensity, and reduce the risk of injury (Denysschen et al., 2021; Gao et al., 2021). Components such as power and speed are especially important in sports that require explosive movements and rapid actions. Power is associated with the ability to generate maximum force in a short period of time, while speed refers to the capacity to perform movements quickly (Dapp et al., 2021; Huang et al., 2023). These two components function synergistically and play a vital role in achieving optimal athletic performance.

Combat sports such as Taekwondo and Wushu place high demands on motor fitness due to their dynamic and high-intensity characteristics. Taekwondo is characterized by rapid and powerful kicking techniques, frequent changes of direction, and intermittent bouts of high-intensity activity during competition. Athletes are required to possess high levels of speed, strength, agility, flexibility, and both aerobic and anaerobic endurance to perform effectively during matches (Wang et al., 2023). Furthermore, Taekwondo matches involve repeated short-duration attacks interspersed with recovery periods, which emphasizes the importance of speed and explosive power (Xu et al., 2025).

Motor fitness is a fundamental component of athletic performance and plays a crucial role in determining success across various sports disciplines (Ab Rasid et al., 2024; Dapp et al., 2021). In combat sports, motor fitness components such as power and speed are particularly important, as they directly influence an athlete's ability to execute techniques effectively and respond rapidly during competition. Power contributes to explosive movements such as strikes, kicks, and jumps, while speed enables athletes to react quickly and perform movements efficiently.

Wushu and Taekwondo are popular combat sports that require high levels of physical fitness, coordination, and technical skill (Linhares et al., 2023; Tu et al., 2025). Although both sports emphasize speed and power, differences in training structure, movement patterns, and competition rules may result in distinct physical adaptations. Wushu places greater emphasis on explosive acrobatic movements and dynamic stances, whereas Taekwondo focuses more on rapid kicking techniques and fast footwork. Previous studies have examined motor fitness components in combat sports; however, most research has focused on a single sport or compared combat sports with non-combat sports. Limited studies have directly compared motor fitness characteristics between Wushu and Taekwondo athletes within the same competitive context. This gap highlights the need for comparative studies that can provide sport-specific insights into physical performance.

Therefore, the present study aims to compare selected motor fitness components, specifically power and speed, between Wushu and Taekwondo players of Manipur. The findings are expected to contribute to a better understanding of sport-specific physical demands and provide practical implications for coaches and trainers in developing effective training strategies. Similarly, Wushu performance is influenced by physical fitness, technical proficiency, and tactical execution. Physical fitness supports the effective execution of techniques and tactics and is therefore considered a fundamental factor in achieving success in Wushu competitions. A high level of motor fitness enhances movement efficiency, coordination, balance, and explosive actions required during performance routines and combat situations.

Despite the similarities between Taekwondo and Wushu as combat sports, differences in movement characteristics, training methods, and performance demands may result in variations in specific motor fitness components. However, comparative studies examining motor fitness characteristics, particularly power and speed, between Wushu and Taekwondo athletes remain limited, especially at the state level. Therefore, a comparative analysis of selected motor fitness components between Wushu and Taekwondo players is necessary to provide empirical evidence regarding sport-specific physical demands.

Based on this background, the present study aims to compare selected motor fitness components, namely power and speed, between Wushu and Taekwondo players of Manipur. The findings of this study are expected to contribute to a deeper understanding of motor fitness profiles in combat sports and provide practical implications for coaches, trainers, and sport scientists in designing training programs tailored to the specific demands of each sport.

METHOD

Participants

The participants of this study consisted of 40 male athletes who had participated in state-level competitions in Manipur. The sample included 20 Wushu players and 20 Taekwondo players. All participants were between 18 and 23 years of age at the time of data collection. The selection of participants was based on their active involvement in competitive training and participation at the state level, ensuring that the subjects possessed comparable competitive experience within their respective sports. All participants were physically fit and free from any injury that could affect their performance during testing.

Research Design

This study employed a comparative research design to examine differences in selected motor fitness components between Wushu and Taekwondo players of Manipur. The comparative approach was used to identify similarities and differences in performance outcomes between two independent groups based on their sport specialization. The study focused on two motor fitness components, namely power and speed, which are considered essential for performance in combat sports. The independent variables in this study were the type of sport, Wushu and Taekwondo, while the dependent variables were power and speed as measured through standardized physical fitness tests.

Instruments

The instruments used in this study were standardized motor fitness tests to measure power and speed. Power was assessed using the standing broad jump test (Marin-Jimenez et al., 2024), while speed was measured using the 50 meter dash run test (Taati et al., 2022). These tests were selected because they are commonly used in physical education and sports science research to evaluate lower-body explosive power and sprint speed.

The standing broad jump test was used to measure the explosive power of the lower limbs. The equipment required for this test included a measuring tape and chalk or marking powder. The distance jumped by the participant was measured in centimeters and recorded as the score.

The 50 meter dash run test was employed to assess sprint acceleration and speed. The equipment used for this test included a marked running track, stopwatch, cones or markers, and a flat surface of at least 70 meters. The time taken by each participant to complete the 50 meter distance was measured in seconds and recorded as the score.

Procedures

Prior to data collection, all participants were informed about the objectives and procedures of the study. A standardized warm-up was provided to ensure that the participants were physically prepared for the testing session. Each participant was given three trials for each test, and the best performance was recorded for data analysis. For the standing broad jump test (Figure 1), the participants were instructed to stand behind the starting line with both feet parallel. They were asked to jump forward as far as possible by bending the knees and swinging the arms to generate maximum force. The jump was performed from a standing position without a run-up. The distance between the starting line and the nearest point of landing was measured and recorded as the score. Three trials were allowed for each participant, and the best attempt was used as the final score.

Figure 1. Standing broad jump

For the 50 meter dash run test (Figure 2), the participants performed a single maximal sprint over a distance of 50 meters. The test began from a stationary standing position, with one foot placed in front of the other behind the starting line. After the command "set" followed by "go," the participants sprinted as fast as possible toward the finish line. Timing was started at the first movement and stopped when the participant crossed the finish line. Three trials were conducted, and the best time recorded to the nearest two decimal places was used for analysis

Figure 2. 50 meters dash run

Data Analysis

The data collected from the standing broad jump test and the 50 meter dash run test were analyzed using descriptive and inferential statistical techniques. Descriptive statistics were used to determine the mean and standard deviation of power and speed for both Wushu and Taekwondo players. To examine differences in the selected motor fitness components between the two groups, an independent t-test was employed for each variable. The level of significance was set at 0.05 to test the research hypothesis. All statistical analyses were performed using IBM Statistical Package for the Social Sciences (SPSS) version 20.

RESULTS AND DISCUSSION

Results

The data obtained from the standing broad jump test and the 50 meter dash run test were analyzed to determine differences in selected motor fitness components between Wushu and Taekwondo players. Descriptive statistics were used to calculate the mean and standard deviation for each variable, followed by inferential analysis using an independent t-test to compare the performance of the two groups (Table 1).

Table 1. Mean Comparison of Power

Variable	Groups	N	Mean	SD	't' Value
Power	Wushu	20	8.42	0.31	1.71
	Taekwondo	20	8.19	0.53	

The table-1 reveals that the Mean values (M) and Standard Deviation values (SD) of power of 20/20 players of Wushu and Taekwondo players were 8.42±0.31 and 8.19±0.53.There was no significant difference found in muscular power between Wushu and Taekwondo players (Figure 3).

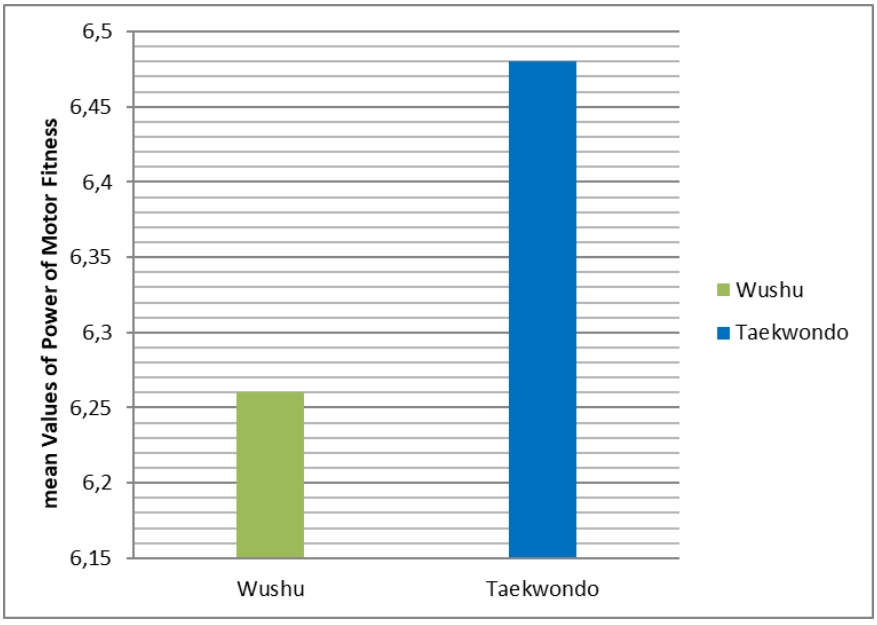

Figure 1. Graphical Representation of Power

The results of the analysis indicated that there was no statistically significant difference in power between Wushu and Taekwondo players at the 0.05 level of significance. This finding suggests that both groups demonstrated relatively similar levels of lower-body explosive power, which may be attributed to the comparable physical demands and training characteristics of both combat sports.

In contrast, the analysis of speed revealed a statistically significant difference between the two groups. The independent t-test showed that the calculated t-value exceeded the critical value at the 0.05 level of significance, indicating a meaningful difference in sprint performance. Wushu players demonstrated superior speed performance compared to Taekwondo players. This result highlights the variation in speed-related demands and training emphasis between the two sports.

Table 2. Mean Comparison of Speed

Variable	Groups	N	Mean	SD	't' Value
Speed	Wushu	20	6.26	0.17	2.86
	Taekwondo	20	6.48	0.29	

Table 2 reveals that the Mean (M) values and Standard Deviation (SD) values of the speed of 20/20 players of Wushu and Taekwondo players were 6.26± 0.17 and 6.48±0.29. The finding of 't' value between Wushu and Taekwondo has 2.86 significance which was greater than the 't' table value 2.0.2 at 0.05 level of significance. So, there was a significant difference between Wushu and Taekwondo in speed (Figure 4).

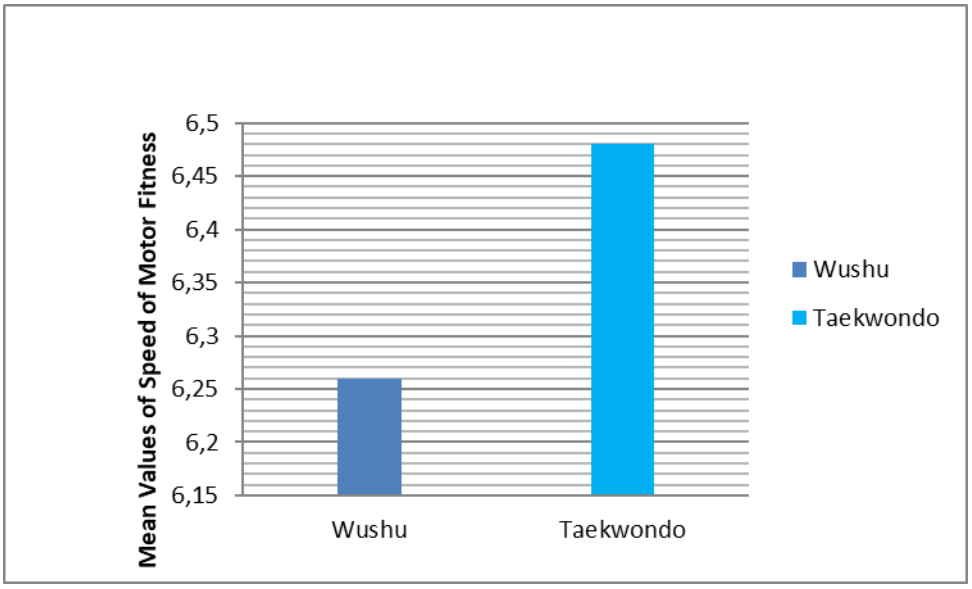

Figure 2. Graphical Representation of Speed

The results of the study indicated that there was no statistically significant difference in power between Wushu and Taekwondo players, as measured by the standing broad jump test. However, a statistically significant difference was observed in speed performance, with Taekwondo players demonstrating faster sprint times compared to Wushu players in the 50-meter dash run test.

These findings suggest that while both groups possess comparable levels of explosive power, differences exist in speed performance, potentially reflecting the specific physical demands and training emphases of each sport.

Discussions

The findings of the present study revealed differences in selected motor fitness components between Wushu and Taekwondo players of Manipur. The analysis showed no significant difference in power between the two groups, while a significant difference was observed in speed. These results indicate that although both sports belong to the category of combat sports and require high physical

performance, variations in training characteristics and movement patterns may influence specific motor fitness components.

The absence of a significant difference in power between Wushu and Taekwondo players suggests that both groups possess comparable levels of lower-body explosive strength. This similarity may be attributed to the nature of both sports, which emphasize explosive movements such as jumps, rapid directional changes, and forceful strikes. Regular training in both Wushu and Taekwondo involves plyometric actions and dynamic lower-limb movements, which contribute to the development of muscular power. Therefore, the similar power performance observed in this study is consistent with the shared physical demands of these combat sports.

In contrast, the significant difference in speed observed between the two groups indicates that speed may be more sport-specific in nature. Wushu players demonstrated superior sprint speed compared to Taekwondo players, which may be related to differences in movement execution and training emphasis. Wushu training often involves continuous and rapid whole-body movements, fast transitions, and quick execution of techniques, which may contribute to enhanced sprinting ability. Speed is a critical component in combat sports, as it allows athletes to initiate attacks, respond quickly to opponents, and maintain competitive advantage during performance (Di Martino et al., 2024; Hsieh et al., 2025).

The findings of this study are also supported by previous research indicating that speed and power are essential determinants of performance in combat sports, but their relative importance may vary depending on the specific characteristics of each sport. While Taekwondo emphasizes powerful and precise kicking techniques, Wushu places greater emphasis on rapid movement execution and agility, which may explain the observed differences in speed performance.

These results are consistent with the notion that sport-specific training influences the development of particular motor fitness components. From a practical perspective, the findings suggest that Wushu coaches may consider incorporating additional speed-focused drills into training programs, while Taekwondo coaches can continue emphasizing speed maintenance alongside power development.

Overall, the results of this study highlight the importance of understanding sport-specific motor fitness profiles. Coaches and trainers should consider these differences when designing training programs, ensuring that athletes develop the motor fitness components most relevant to their sport. Future research may further explore additional motor fitness components and include larger samples or different competition levels to provide a more comprehensive understanding of physical performance in combat sports.

Implications

The findings of this study provide several practical implications for coaches, trainers, and sport scientists involved in combat sports training. The absence of a significant difference in explosive power between Wushu and Taekwondo athletes suggests that both sports require comparable levels of lower-body muscular power, likely due to the frequent use of jumping actions, rapid kicks, and explosive movements during performance. Consequently, strength and plyometric training programs designed to enhance lower-body power may be similarly beneficial for athletes in both disciplines. In contrast, the significant difference observed in sprint speed indicates that speed development may be more sport-specific in nature. The superior sprint performance demonstrated by Wushu athletes suggests that training structures emphasizing rapid movement transitions, continuous footwork, and dynamic whole-body coordination may contribute to enhanced speed capacity. Coaches may therefore consider incorporating targeted sprint drills, agility exercises, and neuromuscular coordination training to optimize sport-specific speed performance. Understanding these differences can assist practitioners in designing more efficient and sport-specific conditioning programs that better reflect the physiological demands of each combat sport.

Research Contribution

This study contributes to the growing body of knowledge in sport science by providing empirical evidence regarding motor fitness characteristics among athletes participating in two widely practiced combat sports, Wushu and Taekwondo. While previous research has often examined physical fitness variables within a single sport discipline, comparative analyses between different

combat sports remain relatively limited. By directly comparing power and speed performance between athletes from both sports, this research offers valuable insight into how sport-specific training environments may influence the development of particular motor fitness components. Furthermore, the findings provide practical reference data for coaches, sport practitioners, and physical educators working with combat sport athletes. The results highlight the importance of understanding sport-specific motor fitness profiles and emphasize that training programs should be carefully adapted to the physiological and technical demands of each discipline. In this way, the study contributes to improving evidence-based training strategies within the field of combat sports performance.

Limitations

Despite the valuable findings obtained in this study, several limitations should be acknowledged. First, the relatively small sample size, consisting of 40 athletes, may limit the generalizability of the results to broader populations of Wushu and Taekwondo athletes. Larger samples across different competitive levels would provide a more comprehensive understanding of motor fitness characteristics in these sports. Second, the study focused exclusively on two motor fitness components, namely power and speed. Although these variables are fundamental for combat sports performance, other components such as agility, reaction time, flexibility, and endurance also play critical roles in determining competitive success. The absence of these additional variables restricts the overall interpretation of the athletes' physical fitness profiles. Finally, the participants were limited to athletes from a single geographic region. Differences in training methodologies, coaching practices, and competitive exposure across regions may influence motor fitness development. Therefore, caution should be exercised when generalizing these findings to other populations or competitive contexts.

Suggestions

Future research should consider expanding the scope of investigation to include additional motor fitness components such as agility, reaction time, balance, and flexibility. Examining a broader range of physical variables would provide a more comprehensive understanding of the physical demands associated with combat sports performance. In addition, future studies are encouraged to include athletes from different competitive levels, such as national or international competitors, in order to better understand how motor fitness characteristics evolve with increased training experience and competitive exposure. Longitudinal research designs may also be useful for examining how sport-specific training programs influence the development of motor fitness over time. Finally, integrating biomechanical analysis, motion capture technology, and advanced performance monitoring systems may offer deeper insights into the neuromuscular and technical mechanisms underlying speed and power performance in combat sports. Such approaches could contribute to the development of more precise and scientifically informed training interventions for athletes.

CONCLUSION

Based on the results of the statistical analysis and discussion, it can be concluded that no statistically significant difference was observed in lower-body explosive power between Wushu and Taekwondo players of Manipur. This finding indicates that athletes from both combat sports demonstrate comparable levels of muscular power, which may reflect the similar biomechanical demands, training stimuli, and explosive movement patterns inherent in their respective training programs.

However, a significant difference was found in speed between the two groups, with Wushu players demonstrating superior sprint performance compared to Taekwondo players. This result suggests that speed may be more sport-specific and influenced by differences in movement patterns, technical execution, and training emphasis between Wushu and Taekwondo. The present study concludes that there is no significant difference in power between Wushu and Taekwondo players of Manipur, while a significant difference exists in speed, favoring Taekwondo players. These findings highlight the influence of sport-specific training on motor fitness characteristics. The study provides practical implications for coaches in designing targeted training interventions and suggests that

future research should include larger samples and additional motor fitness components to further explore performance differences in combat sports.

Overall, the findings of this study highlight the importance of understanding sport-specific motor fitness characteristics. The results may serve as a useful reference for coaches and trainers in designing training programs that focus on enhancing relevant motor fitness components according to the specific demands of each sport. Future studies are recommended to include additional motor fitness variables, larger sample sizes, and different competition levels to further strengthen the generalizability of the findings.

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AUTHOR CONTRIBUTION STATEMENT

EN conceptualized the study, designed the research framework, and supervised the overall implementation of the project. AK contributed to the development of the research methodology, coordinated the data collection process, and assisted in statistical analysis. AB participated in conducting field measurements and contributed to data organization and interpretation. NP assisted in literature review, data validation, and manuscript preparation. FR contributed to data analysis, critical revision of the manuscript, and final editing of the paper. All authors read, reviewed, and approved the final version of the manuscript prior to submission.

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