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Analysis Of The Physical Condition Of Badminton Athletes At The Unp Padang Badminton Academy

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Abstrac: This study aims to analyze the physical condition level of athletes at UNP Badminton Academy Padang. The research employed a descriptive quantitative method. The population consisted of 21 athletes, and total sampling was used, meaning all athletes were included as research samples. Data were collected using physical condition tests, including chin-up, push-up, 30-meter sprint, sit and reach, vertical jump, and beep test. The results showed that the overall physical condition of the athletes was categorized as very poor, with an average score of 2.5. All physical components, including strength, endurance, speed, flexibility, power, and cardiovascular endurance, were still below optimal levels. It can be concluded that the athletes' physical condition needs significant improvement through structured and systematic training programs to support better performance in the future.

Keyword: Physical condition, Badminton athletes, Performance, Training program

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INTRODUCTION

Sports are physical activities that incorporate elements of play and involve competition—whether against oneself, others, or natural conditions (Prima & Kartiko, 2021). In practice, sports often take the form of competitions and must therefore be conducted in the spirit of sportsmanship. In team sports, these activities encourage individuals to compete in a fun, honest environment that upholds the value of teamwork (Adi, 2019).

In addition, sports play a role in fostering mutual understanding, strengthening solidarity, and serving as a unifying force for the nation (Aisha, 2025;Brennan et al., 2025). The government has undertaken various efforts to promote sports participation while improving athletic performance, one of which is through targeted development programs within the community. To achieve optimal performance, various supporting factors must be in place, including mastery of athletic skills and good physical condition (Putri, 2025).

Physical fitness refers to a person's ability to perform physical activities optimally. Good physical condition improves cardiovascular function, heart performance, strength, speed, endurance, flexibility, and accelerates the body's recovery process after exercise (Edmizal & Maifitri, 2021). The components of physical condition include cardiovascular endurance, muscle strength, speed, agility, coordination, balance, reaction time, accuracy, flexibility, and explosive power (Cao et al., 2024). In badminton, the specific physical fitness required includes strength, muscular endurance, speed, flexibility, power, and cardiovascular endurance, all tailored to the technical and tactical demands of the game (Ma et al., 2024).

Physical conditioning is the foundation for developing technique, tactics, and strategy, particularly in competitive sports like badminton (Ihsan et al., 2024). To achieve peak performance, training must be comprehensive, incorporating physical, technical, tactical, and mental aspects (Donie et al., 2023). Athletes must master basic techniques and shot variations, and maintain peak physical condition to perform at their best in matches. Every sport, including badminton, has its own unique characteristics that require training methods tailored to the demands of the game.

Badminton is a popular sport enjoyed by people of all ages. In this game, mastery of basic techniques is essential for athletes to execute a variety of shots and score points. According to (Aksa, 2016), the basic techniques of badminton include racket grip, wrist movement, footwork, and concentration. Meanwhile, stroke techniques consist of the serve, lob, smash, and dropshot. Mastery of these techniques must be supported by good physical condition and regular training to improve the athlete's overall performance.

Based on observations at the UNP Badminton Academy, the athletes' physical condition has not yet been systematically assessed. The athletes appear to tire easily, lack speed, and lack explosive power when chasing the shuttlecock. The training provided tends to be monotonous, such as running laps around the court and footwork drills, leading to boredom. This has resulted in poor athletic performance, as evidenced at the UNP Rector's Cup Championship on June 17, 2025, where no athlete made it into the top eight. Interviews with the coaches revealed that no specific physical fitness tests had ever been conducted, so training focused more on technique. Given these conditions, the researchers were interested in conducting a scientific study on "Analysis of the Physical Condition of Badminton Athletes at the UNP Badminton Academy in Padang."

METHOD

This study used a descriptive research design with a quantitative approach to describe the level of physical condition of athletes at UNP Badminton Academy Padang. Descriptive research was chosen because it aims to systematically present facts or characteristics of a population without manipulating variables. The data obtained from physical tests were analyzed numerically to determine the category of each component of physical condition.

The subjects of this study were all athletes of UNP Badminton Academy Padang, totaling 21 people. The sampling technique used was total sampling, meaning all members of the population were used as research samples. This technique was applied to ensure that the data collected truly represent the overall physical condition of the athletes.

The research procedure was carried out in several stages. Initially, the researcher prepared the instruments and coordinated with the coach and athletes. Then, the athletes were given explanations regarding the objectives and procedures of the tests. After that, the implementation of physical condition tests was conducted according to standardized procedures. Finally, all test results were recorded and documented for further analysis.

Data collection in this study used a series of physical condition test instruments, including the chin-up test to measure arm muscle strength, push-up test to measure arm muscle endurance, 30-meter sprint to measure speed, sit and reach test to measure flexibility, vertical jump test to measure leg muscle power, and beep test to measure cardiovascular endurance. These instruments were selected because they are commonly used and considered valid in measuring components of physical fitness.

The data collection technique was carried out through direct testing, where each athlete performed all test items under supervision. The results of each test were recorded based on standardized assessment criteria. Before the test began, athletes were instructed to perform a warm-up to avoid injury and to ensure optimal performance during testing. The data obtained were analyzed using percentage analysis techniques. Each test result was converted into a score and then categorized according to predetermined norms. The final results were interpreted to determine the overall level of physical condition of the athletes, which were classified into categories such as very good, good, moderate, poor, and very poor.

RESULT

Test data on the strength and endurance of the arm and shoulder muscles of athletes at the UNP Padang Badminton Academy.

Based on the results of the standardized tests of upper body and shoulder muscle strength and endurance for badminton athletes at the UNP Badminton Academy in Padang, 18 athletes (85.71%) fell into the “very poor” category, while 3 athletes (14.29%) fell into the “poor” category. This is shown in the following table:

Table 1. Data on the strength and endurance of the arm and shoulder muscles of badminton athletes at the UNP Badminton Academy in Padang.

Standards for testing the strength and endurance of the arm and shoulder muscles	Category	Value	Frequency	PErcentage
Very poor	< 1	2	18	85,71 %
Poor	2 – 3	4	3	14, 29 %
Average	4 – 5	6	0	0.00%
Good	6 – 8	8	0	0.00%
Very good	>9	10	0	0.00%
Jumlah			**21**	**100%**

The data in the table above can also be seen in the following graph:

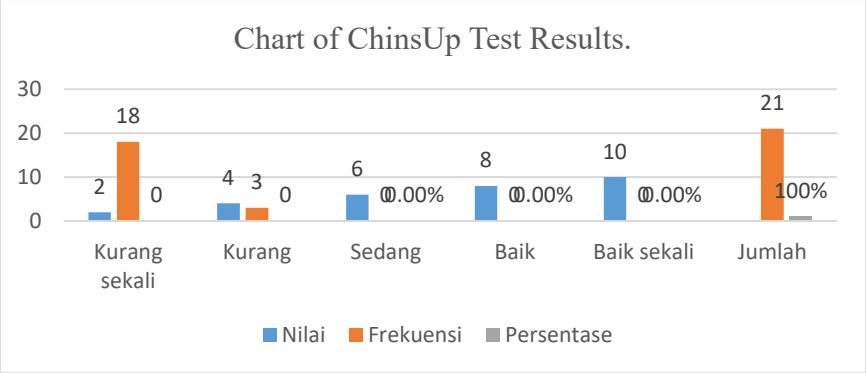

Figure 1. Graphs and Charts Showing the Results of Strength, Endurance, and Arm and Shoulder Muscle Tests for Badminton Athletes at the UNP Badminton Academy in Padang.

Arm Muscle Strength Test Data for Badminton Athletes at the UNP Badminton Academy in Padang.

Based on the arm muscle strength test standards for badminton athletes at the UNP Badminton Academy in Padang, 8 athletes (38.1%) fell into the "very low" category, 9 athletes (42.86%) into the "low" category, and 4 athletes (19.5%) into the "moderate" category. This is shown in the following table:

Table 2. Arm muscle strength test data for badminton athletes at the UNP Badminton Academy in Padang.

Arm Muscle Strength Test Standards	Category	Score	Frequency	Percentage
< 18.00	Very poor	2	8	38,1%
18.50 - < 24.50	Poor	4	9	42,86%
25.50 - < 34.50	Fair	6	4	19,05%
34.50 - < 44.50	Good	8	0	0.00%
>44.50	Very good	10	0	0.00%
Total			**21**	**100%**

The data in the table above can also be seen in the following graph:

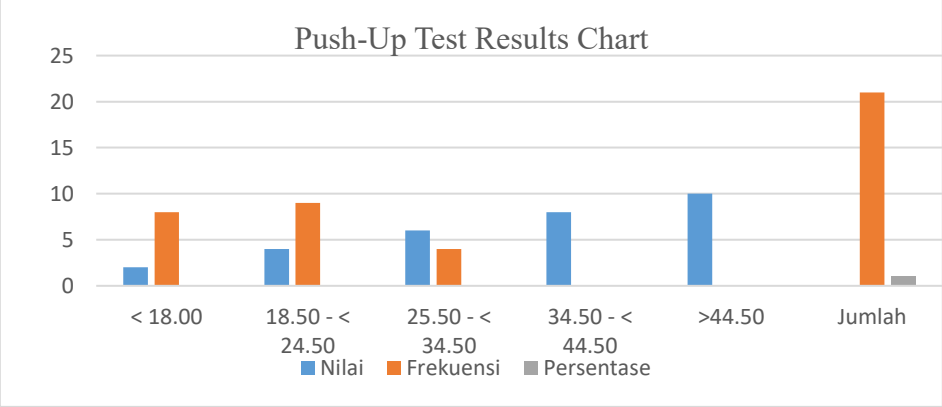

Figure 2. Results of the Arm Muscle Strength Test for Badminton Athletes at the UNP Badminton Academy in Padang.

Speed Test Data for Badminton Athletes at the UNP Badminton Academy in Padang.

Based on the speed test standards for badminton athletes at the UNP Badminton Academy in Padang, 16 athletes (76.19%) fell into the "very poor" category, while 5 athletes (23.81%) fell into the "poor" category.

Table 3. Speed Test Data for Badminton Athletes at the UNP Badminton Academy in Padang.

30-meter sprint standard	Category	Score	Frequency	Percentage
5.12 – 5.50	Very poor	2	16	76,19%
4.73 – 5.11	Poor	4	5	23,81%
4.35 – 4.72	Fair	6	0	0.00%
3.60 – 4.34	Good	8	0	0.00%
3.58 – 3.59	Very good	10	0	0.00%
Total			**21**	**100%**

The data in the table above can also be seen in the following graph:

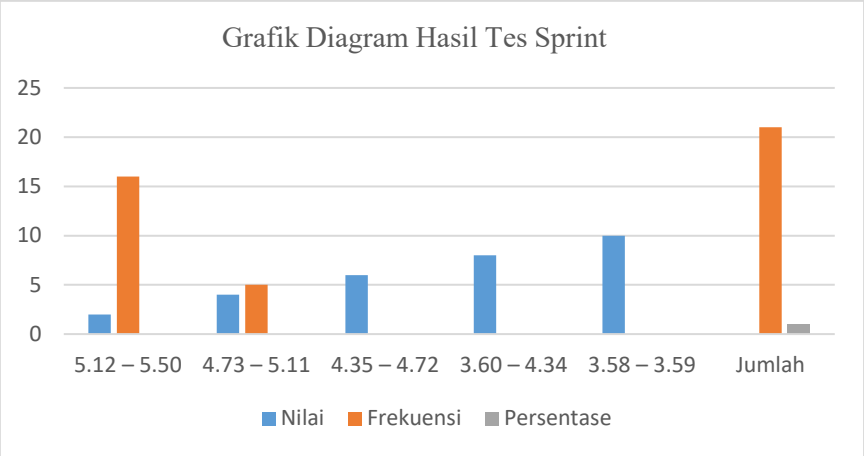

Figure 3. Speed Test Results for Badminton Athletes at the UNP Badminton Academy in Padang.

Flexibility Test Data for Badminton Athletes at the UNP Badminton Academy in Padang.

Based on the flexibility test standards for badminton athletes at the UNP Badminton Academy in Padang, 18 athletes (85.71%) fell into the "very poor" category, while 3 athletes (14.29%) fell into the "poor" category. This is shown in the following table:

Table 4. Flexibility Test Data for Badminton Athletes at the UNP Badminton Academy in Padang.

Flexibility test standard (inches)	Category	Score	Frequency	Percentage
< 10,55"	Very poor	2	18	85,71%
13.00"	Poor	4	3	14,29%
15.5"	Fair	6	0	0.00%
17.5"	Good	8	0	0.00%
>19.5"	Very good	10	0	0.00%
Total			**21**	**100%**

The data in the table above can also be seen in the following graph:

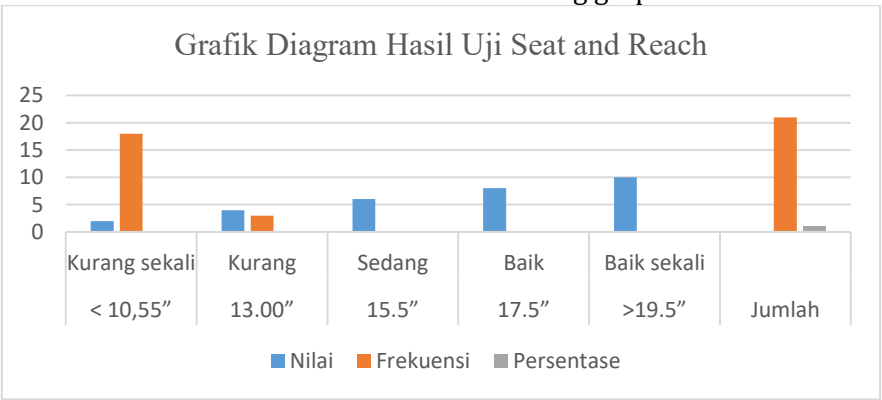

Figure 4. Grafik Diagram Hasil Uji Kelenturan Atlet Bulu Tangkis Akademi Bulu Tangkis UNP Padang.

Data on lower-body muscle strength measured via vertical jumps among badminton athletes from the UNP Badminton Academy in Padang

Based on the results of the lower-body muscle power test using the vertical jump among badminton athletes at the UNP Badminton Academy in Padang, 15 athletes (71.43%) fell into the "very poor" category, 4 athletes (19.5%) into the "poor" category, and 2 athletes (9.25%) into the "moderate" category. This is shown in the following table:

Table 5. Vertical jump test data for badminton athletes at the UNP Badminton Academy in Padang.

Vertical jump test standards (inches)	Category	Score	Frequency	Percentage
5"	Very poor	2	15	71,43%
12"	Poor	4	4	19,05%
19"	Fair	6	2	9,25%
23"	Good	8	0	0.00%
>25"	Very good	10	0	0.00%
Total			**21**	**100%**

The data in the table above can also be seen in the following graph:

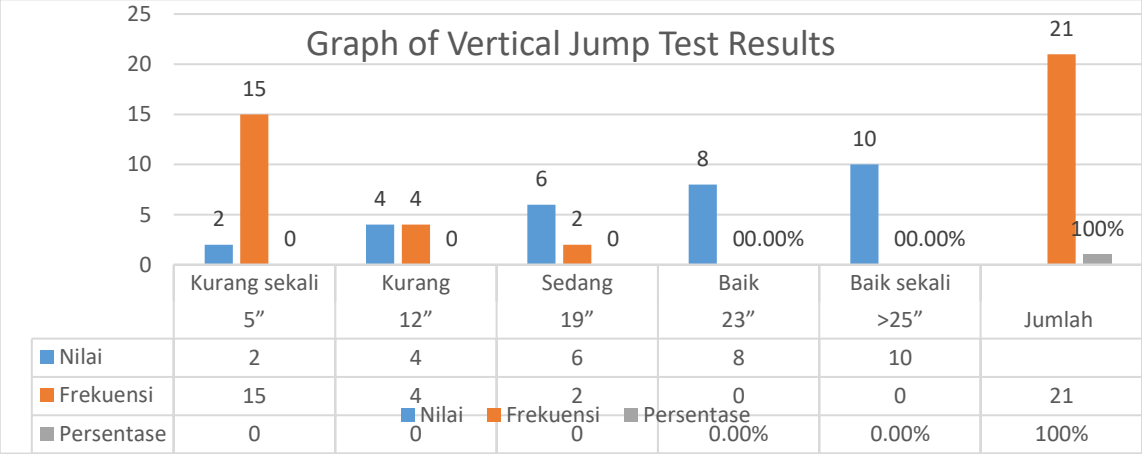

Figure 5. Graph of Lower Limb Muscle Power Test Results for Badminton Athletes at the UNP Badminton Academy in Padang.

Beeptest results for badminton athletes at the UNP Badminton Academy in Padang.

Based on the beep test standards for badminton athletes at the UNP Badminton Academy in Padang, 20 athletes (95.24%) fell into the "very poor" category, while 1 athlete (4.76%) fell into the "moderate" category.

Table 6. Beep Test Data for Badminton Athletes at the UNP Badminton Academy in Padang

Beeptest standard	Category	Score	Frequency	Percentage
< 40.5	Very poor	2	20	95,24%
40.6 – 50.4	Poor	4	0	0.00%
50.5 – 55.4	Fair	6	1	4,76%
55.5 – 65	Good	8	0	0.00%
>65	Very good	10	0	0.00%
Total			**21**	**100%**

The data in the table above can also be seen in the following graph:

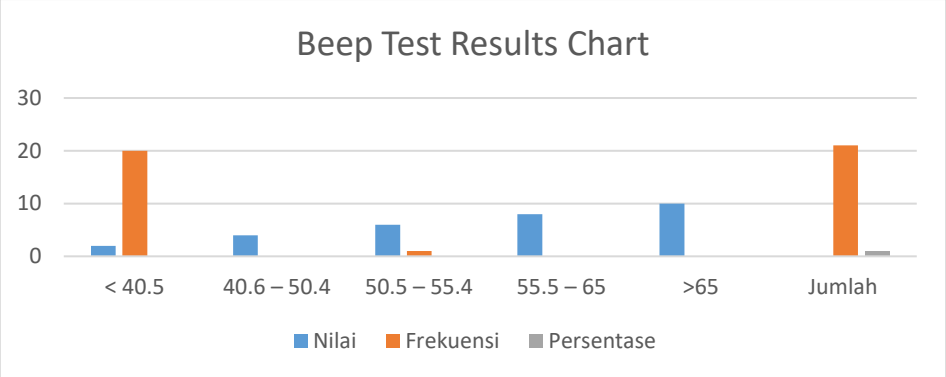

Figure 6. Graph of VO2MAX Test Results for Badminton Athletes at the UNP Badminton Academy in Padang.

Data Analysis

The results of the study indicate that, based on the summary of the tests conducted, the average physical fitness level of badminton athletes at the UNP Badminton Academy in Padang is 2.5, which falls into the "very poor" category, as it lies within the 2.0–3.9 range. Furthermore, the analysis results also indicate that all 21 athletes (100%) fall into the "very poor" category, as all individual scores are within the 2.0–3.9 range. This is illustrated in the following table.

Table 7. Summary of Data on the Physical Condition of Badminton Athletes at the UNP Badminton Academy in Padang.

No	Score range	Classification	Frequency	Percentage
1	2,0 – 3,9	Very Poor (VP)	21	100%
2	4,0 – 5,9	Poor (P)	0	0,00%
4	6,0 – 7,9	Fair (F)	0	0,00%
5	8,0 – 9,5	Good (G)	0	0,00%
	9,6 – 10	Very Good (VG)	0	0,00%
			21	100%

DISCUSSION

Based on the results of the above analysis, it is clear that the physical condition of the badminton players at the UNP Badminton Academy in Padang is very poor. This is reflected in the fact that the players were unable to perform the physical fitness tests to their full potential, resulting in the majority of them falling into the low category. This indicates that physical components such as strength, speed, endurance, and flexibility have not developed optimally. According to Candra & Farhanto (2021), physical condition is the primary foundation for achieving athletic performance; therefore, if physical condition is low, the athlete's ability to compete will also decline. This is further supported by Harsono (2018), who states that the quality of physical condition is crucial in determining an athlete's success in applying techniques and tactics on the court (Harsono, 2018).

This is a rather serious issue for the athletes at the UNP Badminton Academy in Padang, as peak physical condition is essential for them to perform at their best in matches. In badminton, athletes must possess high endurance, quick reflexes, and sufficient power to respond to the shuttlecock swiftly and accurately. Prima & Kartiko (2021) explain that athletic performance is greatly influenced by the quality of physical conditioning that is trained systematically and continuously. Therefore, to achieve optimal performance, physical conditioning must be the primary focus in the training programs designed by coaches.

Physical condition refers to the overall physical capabilities that form the foundation for achieving athletic performance. Initial physical fitness is crucial as a guideline for designing training programs tailored to athletes' needs. Hendrayana (2016) states that an initial physical fitness assessment is necessary to determine an athlete's readiness level so that training programs can be effectively adjusted. Therefore, badminton athletes at the UNP Badminton Academy in Padang need to enhance their physical training in a structured manner to support their performance in competitions.

The poor physical condition of the badminton players at the UNP Badminton Academy in Padang, which falls into the "very poor" category, is believed to be caused by a lack of specific and structured physical training. Athletes tend to focus more on technical and tactical training than on physical conditioning. However, according to Oktanansa et al (2022), physical fitness is a key factor in supporting the success of technical and tactical skills in badminton. Additionally, low cardiovascular endurance may result from a lack of regular aerobic exercises, such as medium-distance running. Recent research by Saleh et al (2024) indicates that badminton demands high physical capacity, particularly in the areas of endurance, speed, and power, making structured physical training essential.

In addition to training factors, physical condition is also influenced by other factors such as rest patterns, nutrition, and physical recovery. Adequate rest is essential for the body to recover after strenuous physical activity. Kong et al (2025) states that a lack of sleep can cause fatigue and reduce athletic performance. This is also supported by research (Vitale et al., 2019) showing that sleep quality has a significant relationship with athletes' physical performance. Additionally, injuries sustained by some players can also affect test results, preventing them from performing at their best.

This study was conducted thoroughly, but there are still several limitations. The researchers did not monitor the athletes' physical and mental conditions prior to the test, did not monitor their food intake or mealtimes, and did not account for the athletes' rest periods before the test was administered. Furthermore, the athletes' daily activities, which could affect their physical condition, were not monitored. This aligns with the view Lima-Alves et al (2021) that physical condition is influenced by various internal and external factors, meaning that measurement results can be affected by the conditions at the time of data collection.

The results of this study are consistent with research conducted over the past 10 years. A study by Dermawan (2018) showed that the physical condition profiles of futsal players were mostly in the poor to adequate categories. Furthermore, a study by Ardi & Rosmaneli (2020) found that the physical condition of badminton athletes remains in the low category, particularly regarding endurance and strength. Another study by Fildania & Jayadi (2022) also indicates that junior badminton players predominantly fall into the "poor" to "very poor" categories. Furthermore, an international study by Abian-Vicen et al (2020) revealed that badminton players' performance is significantly influenced by physical capacities such as muscle strength, endurance, and speed. Thus, the results of this study reinforce previous findings that the physical condition of badminton athletes still needs to be improved through more targeted and systematic training programs.

CONCLUSION

This study concludes that the overall physical condition of athletes at UNP Badminton Academy Padang is categorized as very poor, as indicated by the low average score and suboptimal results across all measured physical components, including strength, endurance, speed, flexibility, power, and cardiovascular fitness. These findings suggest that the athletes' physical readiness is not yet sufficient to support optimal performance in badminton competitions. Therefore, it is recommended that coaches place greater emphasis on structured, systematic, and varied physical training programs to improve athletes' overall fitness. Future research is encouraged to explore more specific training interventions, monitor additional factors such as nutrition, rest, and psychological conditions, and involve a larger sample size to obtain more comprehensive results.

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