



## The Physical Condition Of Badminton Athletes Of The Taufiq Sport Club In Sambas Regency

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### ABSTRACT

Badminton is a sport that requires an optimal physical condition profile to support technical performance, tactical execution, and competitive achievement. Components such as endurance, speed, agility, and arm muscle strength play a crucial role in enabling athletes to perform effectively during training and competition. Therefore, evaluating athletes' physical condition is essential for developing appropriate training programs. This study aimed to determine the physical condition profile of badminton athletes at Taufiq Sport Club, Sambas Regency, based on endurance, speed, agility, and arm muscle strength. This research employed a descriptive survey method involving 10 athletes consisting of 5 male and 5 female athletes. Data were collected using the Bleep Test to measure endurance, the 30-Meter Sprint Test to assess speed, the Illinois Agility Test to evaluate agility, and the Push-Up Test to measure arm muscle strength. The collected data were analyzed using descriptive statistics in the form of percentages. The results revealed that female athletes' endurance was categorized as good (40%), very good (40%), and low (20%), while male athletes showed excellent endurance (80%) and very low endurance (20%). Speed performance was relatively poor, with 100% of female athletes categorized as very poor, while male athletes were classified as very poor (80%) and poor (20%). Agility was outstanding, with all female and male athletes (100%) classified as very good. Arm muscle strength was also favorable, with all female athletes (100%) categorized as very good, while male athletes were classified as very good (60%), good (20%), and sufficient (20%). In conclusion, the physical condition of Taufiq Sport Club badminton athletes is generally characterized by excellent agility and good endurance and arm muscle strength. However, speed remains the weakest component and should become the primary focus of future training programs to enhance overall athletic performance.

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- Manuscript preparation;
- Obtaining funding

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## INTRODUCTION

Sport is a physical activity carried out in a planned and structured manner to improve a person's physical fitness and motor skills. Besides maintaining health, sport also has educational value in character building, such as discipline, sportsmanship,



cooperation, and self-control. According to Syafruddin & Asri (2022), a person's repeated involvement in sports activities can form positive habits in daily life. One sport that is widely popular among the public and is taught in physical education is badminton. Badminton is a racket game played by singles or doubles and can be played on indoor or outdoor courts. This sport was first widely known in England and the name badminton comes from a house or palace in Gloucestershire. The popularity of badminton in Indonesia has made this sport develop not only as a means of recreation, but also as a sport for education, health, and achievement. Therefore, badminton requires good coaching, especially in terms of the physical condition of athletes.

Badminton is a sport that demands technical and tactical skills, as well as good physical condition. Badminton athletes are required to possess physical components such as strength, endurance, speed, and agility to be able to display optimal performance during matches. According to Suchomel et al. (2016) physical condition qualities such as strength, power, and endurance are important factors in improving performance and achieving athletic success. Furthermore, Joyce et al. (2014) the development of athletes' physical condition must be carried out systematically and progressively so that athletes' functional abilities can develop optimally to support sports performance. Thus, physical condition is an important foundation in supporting the mastery of badminton techniques and strategies. Furthermore, physical condition consists of several important components that are interrelated in supporting athlete performance.

Physical condition is a unified whole consisting of various interrelated and inseparable biomotor components. García-Unanue et al. (2020) physical condition components such as strength, speed, endurance, and agility are the main factors that determine an athlete's performance in a match. In badminton, good physical condition can help athletes move faster, maintain balance, and maintain performance throughout the match. According to Pamungkas et al. (2025) Physical condition greatly influences players' success in implementing game techniques and strategies. This is reinforced by Herridge et al. (2020) who state that physical condition components such as endurance, strength, speed, and agility are crucial elements in athlete performance. This research shows that improving these components directly impacts athletes' physical abilities and athletic performance. Therefore, regular physical condition evaluations are necessary to clearly understand the athlete's abilities.

The importance of physical fitness in competitive sports requires coaches to regularly evaluate athletes' physical abilities. Thornton et al. (2019) an athlete monitoring system is used to analyze performance data, fatigue, and training responses so that coaches can adjust training programs and reduce the risk of injury. Vella et al. (2022) also explained that in high-level sports, an athlete's performance is determined not only by technique and tactics, but also by physical fitness. Optimal physical condition is a crucial foundation for the effective execution of technical skills and game strategies during a match. Therefore, physical fitness training programs must be designed systematically and tailored to each athlete's needs to optimally improve performance. With measurable physical fitness evaluations, coaches can determine athletes' abilities in each biomotor

component, thus providing more targeted training. In line with this, Taufiq Sport Club also strives to develop athletes through programmed training.

Based on observations, Taufiq Sport Club (TSC) is a badminton club established on October 1, 2023, in Sambas Regency and coached by Taufiq Febriansyah. This club provides a platform for developing male and female athletes' talents, skills, and achievements in badminton. TSC conducts training at the Sambas Regency Ministry of Religious Affairs Sports Hall and the Muda Karya Sports Hall and has participated in various competitions from regional to national levels. In an effort to improve athlete performance, the coaching provided focuses not only on playing techniques but also on improving the athletes' physical condition. Therefore, this study aims to determine the physical condition of badminton athletes at the Taufiq Sport Club in Sambas Regency in terms of endurance, speed, agility, and strength. The results of this study are expected to serve as evaluation material for coaches in developing more effective training programs that suit the athletes' needs.

## METHODS

The method used in this research is a survey with a quantitative approach. According to Irfan Syahroni (2022), quantitative research is a research method based on the philosophy of positivism, using specific samples, data collection through research instruments, and statistical data analysis to test predetermined hypotheses. Therefore, this research aims to provide a systematic overview of the phenomenon under study through a quantitative descriptive approach using a survey method, so that the data obtained can be analyzed according to conditions in the field.

This study involved badminton athletes from the TSC club in Sambas Regency with a population of 55 athletes, consisting of 34 female athletes and 21 male athletes. The research sample was taken using a purposive sampling technique of 10 athletes, consisting of 5 boys and 5 girls aged 8–18 years who actively participated in training. This study is a quantitative descriptive study that aims to describe the physical condition of badminton athletes from the TSC club in Sambas Regency. Bleep test, 30-meter sprint, Illinois Agility Test, and push-ups were the test instruments to measure the athletes' abilities. Data analysis in this study was carried out using percentage-based quantitative descriptive analysis techniques. Researchers grouped the test results into normative data for each test as follows:

**Table 1.**  
Bleep test normative data

Category	Male (Level)	Female (Level)
Very low	< 3/5	< 2/7
Low	3/6 - 4/5	2/8 - 3/7
Average	4/6 - 6/2	3/8 - 5/2
Good	6/3 - 7/5	5/3 - 6/4
Very good	7/6 - 9/2	6/5 - 7/5
Excellent	> 9/3	> 7/6

**Table 2.**  
 Normative data for 30 meter sprint

Category	Male (Second)	Female (second)
Very good	≤ 4,8	≤ 5,2
Good	4,9 – 5,3	5,3 – 5,7
Sufficient	5,4 – 5,9	5,8 – 6,3
Poor	6,0 – 6,5	6,4 – 6,9
Very poor	≥ 6,6	≥ 7,0

Source : (Wicaksono & Kusuma, 2021)

**Table 3.**  
 Illinois agility test normative data

Category	Male (Second)	Female (second)
Very good	≤ 17,5	≤ 18,5
Good	17,6 – 18,9	18,6 – 19,9
Sufficient	19,0 – 20,5	20,0 – 21,5
Poor	20,6 – 22,0	21,6 – 23,0
Very poor	≥ 22,1	≥ 23,1

Source : (Winata & Hariyanto, 2015)

**Table 4.**  
 Push-up normative data

Category	Male	Female
Very good	≥ 30	≥ 25
Good	21 – 29	18 – 24
Sufficient	12 – 20	10 – 17
Poor	6 – 11	4 – 9
Very poor	≤ 5	≤ 3

Source : (Wicaksono & Kusuma, 2021)

## RESULTS AND DISCUSSION

### Result

#### Endurance Test Results (Bleep Test) on Badminton Athletes at Taufiq Sport Club in Sambas Regency

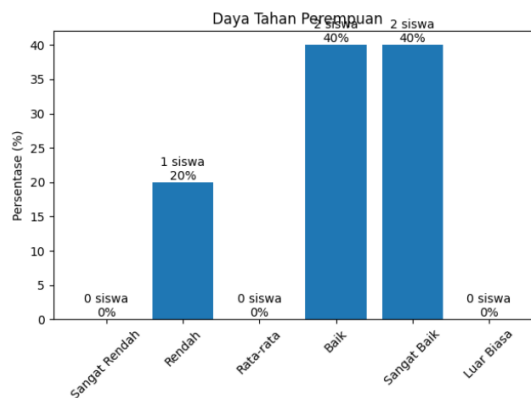
The endurance test in this study used the Bleep Test to measure the athletes' cardiorespiratory endurance. Test results were stated based on the level achieved by the athletes according to the established implementation procedures, then classified into very good, good, sufficient, and poor categories. The percentage of athletes in each category was analyzed to provide a general overview of the endurance level of badminton athletes in Sambas Regency, as presented in the following table:

**Table 5.**  
 Female endurance test results

Category	Female	Frequency	Percentage
Very low	< 2/7	0	0%
Low	2/8 – 3/7	1	20%
Average	3/8 – 5/2	0	0%
Good	5/3 – 6/4	2	40%
Very good	6/5 – 7/5	2	40%
Excellent	> 7/6	0	0%
<b>Total</b>		<b>5</b>	<b>100%</b>

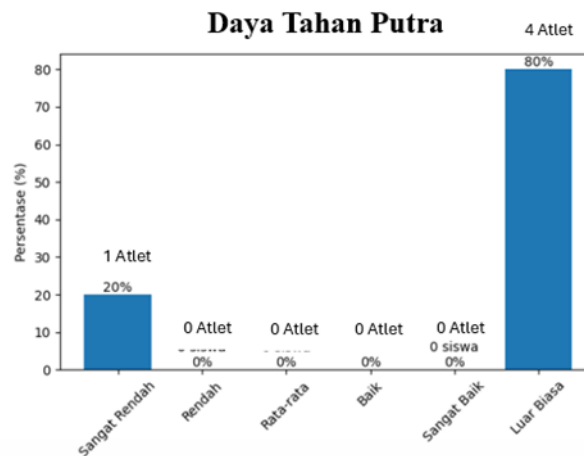
**Table 6.**  
 Male endurance test results

Category	Male	Frequency	Percentage
Very low	< 3/5	1	20%
Low	3/6 - 4/5	0	0%
Average	4/6 - 6/2	0	0%
Good	6/3 - 7/5	0	0%
Very good	7/6 - 9/2	0	0%
Excellent	> 9/3	4	80%
<b>Total</b>		<b>5</b>	<b>100%</b>



**Figure 1.**

Diagram of the results of the female endurance test



**Figure 2.**

Diagram of the results of the male endurance test

The Bleep Test results showed that female athletes were predominantly in the Good and Very Good categories, with 40% each, while 20% were in the Low category. Among male athletes, 80% were in the Excellent category and 20% were in the Very Low category.

### **Speed Test Results (30 M Sprint) for Badminton Athletes at Taufiq Sport Club in Sambas Regency**

The speed test involved a 30-meter sprint, measured using a stopwatch in seconds. Each athlete's test results were then grouped into speed categories according to assessment standards. Data analysis was presented as a percentage of athletes in

each category, providing a general overview of the athletes' speed levels. The speed test results are shown in the following table:

**Table 7.**

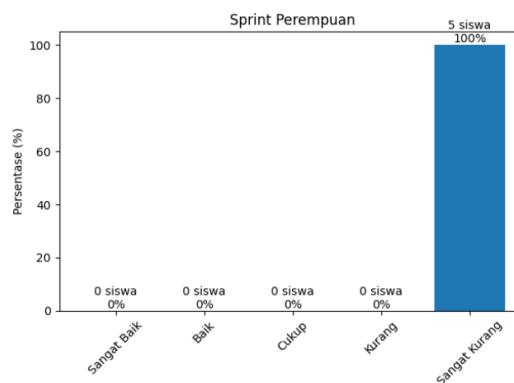
Female speed test results

Category	Female	Frequency	Percentage
Very good	≤ 5,2	0	0%
Good	5,3 – 5,7	0	0%
Sufficient	5,8 – 6,3	0	0%
Poor	6,4 – 6,9	0	0%
Very poor	≥ 7,0	5	100%
<b>Total</b>		<b>5</b>	<b>100%</b>

**Table 8.**

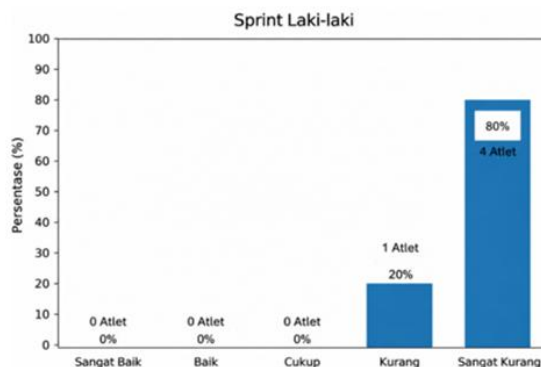
Male speed test results

Category	Male	Frequency	Percentage
Very good	≤ 4,8	0	0%
Good	4,9 – 5,3	0	0%
Sufficient	5,4 – 5,9	0	0%
Poor	6,0 – 6,5	1	20%
Very poor	≥ 6,6	4	80%
<b>Total</b>		<b>5</b>	<b>100%</b>



**Figure 3.**

Diagram of the results of the female speed test



**Figure 4.**

Diagram of the results of the male speed test

The sprint test results showed that all female athletes (100%) were in the Very Poor category. Among male athletes, 80% were in the Very Poor category and 20% were in the Poor category.

## Results of the Illinois Agility Test on Badminton Athletes at the Taufiq Sport Club in Sambas Regency

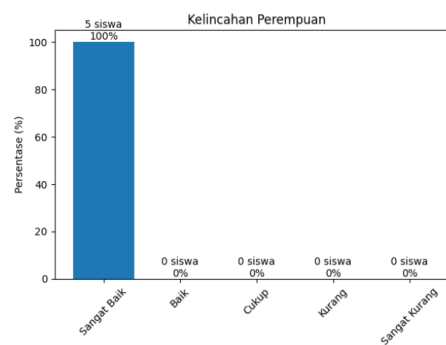
Agility was measured using the Illinois Agility Test to determine an athlete's ability to change direction quickly and in a controlled manner. Test results were recorded in seconds and then classified into agility level categories based on test norms. The test data were analyzed as a percentage of athletes in each category, providing a general overview of the badminton athletes' agility levels. The results of the agility test can be seen in the table.

**Table 9.**  
Female agility test results

Category	Female	Frequency	Percentage
Very good	≤ 18,5	5	100%
Good	18,6 – 19,9	0	0%
Sufficient	20,0 – 21,5	0	0%
Poor	21,6 – 23,0	0	0%
Very poor	≥ 23,1	0	0%
<b>Total</b>		<b>5</b>	<b>100%</b>

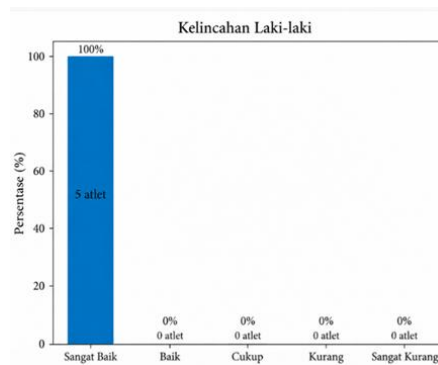
**Table 10.**  
Male agility test results

Category	Male	Frequency	Percentage
Very good	≤ 17,5	5	100%
Good	17,6 – 18,9	0	0%
Sufficient	19,0 – 20,5	0	0%
Poor	20,6 – 22,0	0	0%
Very poor	≥ 22,1	0	0%
<b>Total</b>		<b>5</b>	<b>100%</b>



**Figure 5.**

Diagram of the results of the female agility test



**Figure 6.**

Diagram of the results of the male agility test

Agility test results showed that all female and male athletes (100%) were in the Very Good category. There were no athletes in any other category.

### Arm Muscle Strength Test Results (Push-Ups) on Badminton Athletes at Taufiq Sport Club in Sambas Regency

The arm muscle strength test was conducted using a push-up test to measure the athlete's arm muscle strength. Assessment was based on the number of repetitions performed according to the test procedure, then grouped into strength level categories. The analysis results were presented as a percentage of athletes in each arm muscle strength category, providing a general overview of the athlete's strength condition. The results of the arm muscle strength test can be seen in the table.

**Table 11.**

Results of the female arm muscle strength test

Category	Female	Frequency	Percentage
Very good	≥ 25	5	100%
Good	18 - 24	0	0%
Sufficient	10 - 17	0	0%
Poor	4 - 9	0	0%
Very poor	≤ 3	0	0%
<b>Total</b>		<b>5</b>	<b>100%</b>

**Tabel 12**

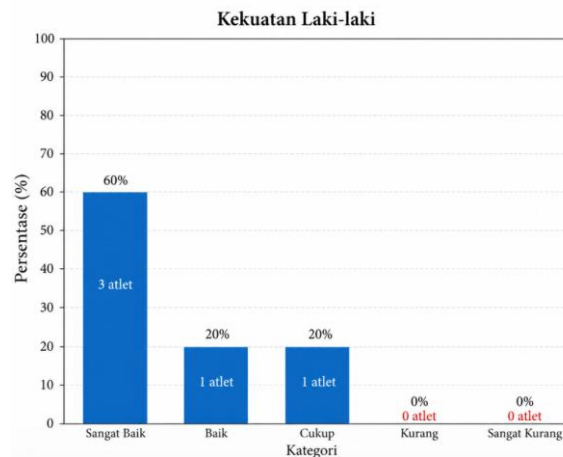
Results of the male arm muscle strength test

Category	Male	Frequency	Percentage
Very good	≥ 30	3	60%
Good	21 - 29	1	20%
Sufficient	12 - 20	1	20%
Poor	6 - 11	0	0%
Very poor	≤ 5	0	0%
<b>Total</b>		<b>5</b>	<b>100%</b>



**Figure 7.**

Female strength test results diagram



**Figure 8.**

Male strength test results diagram

Strength test results showed that all female athletes (100%) were in the Very Good category. Among male athletes, 60% were in the Very Good category, 20% in the Good category, and 20% in the Fair category. Overall, the strength of male athletes was classified as good to very good.

## Discussion

This study aims to determine the physical condition of Taufiq Sport Club badminton athletes in Sambas Regency, including endurance, speed, agility, and arm muscle strength. Based on the Bleep Test results, the endurance of female athletes is in the good and very good categories at 40%, respectively, and 20% is in the low category. Meanwhile, male athletes are dominated by the very good category at 80% and 20% in the low category. These results indicate that most athletes have sufficient endurance capabilities to support badminton game activities. According to Wibowo et al. (2022), a high  $VO_2$ max capacity is significantly related to badminton athlete performance because it helps the energy recovery process between rallies during the match. In addition, Hidayat and Prasetyo (2023) explained that interval training is effective in increasing the aerobic endurance of badminton athletes. This opinion supports the results of the study that most Taufiq Sport Club athletes have good to extraordinary endurance. Good endurance is very important in badminton because athletes are required to be able to move actively with high intensity without experiencing excessive fatigue during the match.

In the speed component, measured using the 30-meter sprint, the study results showed that all female athletes (100%) were in the very poor category. Meanwhile, 80% of male athletes were in the very poor category and 20% were in the poor category. These results indicate that athletes' sprinting and acceleration abilities still need to be improved. According to Nugroho and Hidayat (2023), speed has a significant relationship with the effectiveness of footwork and attacking ability in badminton. Athletes with low speed tend to be late in reaching the shuttlecock, which can affect the quality of play. Lum et al. (2019) also explained that combination of sprint training and plyometric

training can significantly improve an athlete's sprint speed capabilities, including increased acceleration and movement speed, due to the neuromuscular adaptations resulting from explosive training. This opinion supports the research findings that speed training programs need more attention in the development process of Taufiq Sport Club athletes. In addition to training factors, low sprint results can also be influenced by running technique, leg muscle strength, and suboptimal acceleration training performed by athletes.

In addition to training-related factors, the low speed performance of athletes may also be explained from physiological and biomechanical perspectives. According to Thomas J. Suchomel, Sophia Nimphius, and Michael H. Stone (2018), sprint performance is highly dependent on neuromuscular strength and rate of force development (RFD), where insufficient maximal strength reduces an athlete's ability to produce rapid force required for acceleration. From a physiological standpoint, limited activation of fast-twitch muscle fibers and low efficiency of the ATP-PC energy system may also contribute to slower explosive movements in short-distance sprint performance.

Furthermore, Cross et al. (2017) explain that sprint performance is strongly influenced by biomechanical factors such as stride length, stride frequency, ground reaction force, and horizontal force application during acceleration. Inefficient sprint mechanics, poor posture during acceleration, and suboptimal force transmission to the ground can significantly reduce running speed, resulting in delayed movement when reaching the shuttlecock in badminton performance situations.

The results of the agility test using the Illinois Agility Test showed that all male and female athletes (100%) were in the excellent category. These results indicate that athletes possess the ability to move quickly and change direction effectively while playing badminton. According to Saputra and Firmansyah (2020), agility is significantly related to badminton athletes' footwork. Athletes with good agility are more effective at reaching the shuttlecock from various angles of the court. Furthermore, Ardiansyah (2022) explained that specific agility drills and footwork can improve athletes' agility and motor coordination. The study's excellent category for all athletes is thought to be influenced by the regular footwork training performed during club training. Good agility also helps athletes maintain balance and perform quick and precise movements during matches.

Regarding arm muscle strength, measured using the Push-Up test, the study showed that all female athletes (100%) were in the excellent category. Meanwhile, 60% of male athletes were in the excellent category, 20% in the good category, and 20% in the fair category. These results indicate that most athletes have good arm muscle strength to support their shots during play. According to Pratama and Kurniawan (2021), there is a significant relationship between arm muscle strength and badminton athletes' smashing ability. Angga et al. (2024) systematic plyometric training and strength training can significantly increase the explosive power of arm muscles, which ultimately contributes directly to improving the athlete's performance in performing explosive movements. This opinion supports the results of research that the arm muscle strength

of Taufiq Sport Club athletes is already in good to excellent condition. Good arm muscle strength helps athletes produce harder, faster, and more accurate shots during matches.

Overall, the results of the study indicate that the endurance, agility, and arm muscle strength components of Taufiq Sport Club athletes are in the good to excellent category. These results align with various expert opinions stating that physical condition plays a crucial role in supporting badminton athlete performance. However, the speed component still found low results, requiring special attention in training programs. Thus, coaches need to develop more targeted, systematic, and balanced training programs to improve all components of an athlete's physical condition. Speed training programs need to be further enhanced through sprint training, plyometrics, and acceleration training to optimize athletes' physical abilities. With good and balanced physical condition, athletes are expected to be able to improve performance and achieve higher achievements in badminton.

## **CONCLUSION**

In conclusion, the physical condition of Taufiq Sport Club badminton athletes in Sambas Regency generally falls within the good to excellent category, particularly in endurance, agility, and arm muscle strength. The results indicate that most athletes already possess adequate physical abilities to support badminton performance, especially in maintaining movement intensity, changing direction quickly, and producing strong and accurate shots during matches. These findings are consistent with expert opinions stating that physical condition is an essential factor in improving athlete performance and achievement in badminton.

However, the speed component remains relatively low and requires special attention in future training programs. The findings suggest that coaches need to implement more systematic, targeted, and balanced training methods, especially through sprint, plyometric, and acceleration exercises to improve athletes' speed abilities. Therefore, continuous evaluation and development of physical training programs are necessary to optimize the overall physical condition and competitive performance of Taufiq Sport Club athletes.

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