



Correlation Between Physical Endurance and Fundamental Badminton Skills

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Abstract
<p>Objective. This study aims to determine the accuracy of badminton games played by players or athletes with different levels of endurance.</p> <p>Materials and Methods. This study is a type of quantitative descriptive research using a survey method. The subjects of this study were members of UNIGA Badminton UKM, with a total of 20 members.</p> <p>Results. The results show that there is a percentage of endurance levels with 2 students 10% who have good endurance, 7 students with a percentage of 35% have moderate endurance levels, 10 students with a percentage of 50% have poor endurance levels and 1 student with a percentage of 5% has very poor endurance. Furthermore, based on the results of the basic badminton skill technique test, 17 students with a percentage (85%) have a good level of basic technique skills, 3 students with a percentage (15%) have moderate basic technique skills, 0 students with a percentage (0%) have low basic technique skills. After looking at the results of the basic badminton skills technique test of 20 students of UKM Badminton University of Garut, they obtained 675 points, so that the average result obtained in this Physical Endurance test was 34 points, thus the average result is included in the "Good" category. Conclusion t he level of endurance and basic badminton techniques the correlation value (0.188) with a very low relationship level category, it can be said that the level of physical endurance against basic badminton technique skills has a relationship between endurance and basic badminton techniques in members of Garut University Badminton UKM.</p>
Keywords: Badminton Endurance; Basic Techniques

Introduction

Sport is an activity that involves the exertion of physical and mental energy carried out to train the human body, both physically and spiritually in this sense that the definition of sport is a form of physical activity that is carried out in a planned and structured manner where in its implementation it involves repeated body movements to increase physical and spiritual endurance (Setiawan et al., 2021). In further developments, sport is not only a means to maintain health, but also as a competition event that can bring the good name of a group or country (Akbar & Rizki, 2021).

Sport is also an activity that is popular with various groups of people. Currently, sports are done to channel hobbies, maintain health, rehabilitation, and achieve achievements. Sport is a form of physical activity that is planned and structured, involving repeated body movements with the aim of

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physical endurance (Setyawati et al., 2022). One of the most popular sports and is loved by all ages is badminton. Badminton is a sport that is very popular with all groups, from old to young, men and women. Badminton has various types, including recreation and entertainment, Endurance and health care, and sports achievement. As a sport of achievement, badminton is a competitive sport that requires explosive movements, lots of running, jumping, and smashing, reaction skills, changes in speed and direction, and good hand-eye coordination (Akmal Fauzan et al., 2021). Badminton is one of the most famous sports in the world. This sport attracts various age groups, both men and women, and can be played indoors or outdoors, and is used as a competitive event. In badminton, the game uses a net, racket, and shuttlecock. The hitting techniques vary, from soft to very fast hits, accompanied by deceptive movements to outwit the opponent (Wardani, 2023). Badminton is one of the sports of achievement in the international arena. In achieving badminton achievements, the most influential factors are physical condition and basic badminton playing techniques. Physical condition is a very important basic ability for every athlete, including badminton athletes, and must be the focus of training to achieve achievements.

The goal of the badminton game is to try to drop the shuttlecock in the opponent's playing area and try to prevent the opponent from hitting the shuttlecock in the opponent's playing area and try to prevent the opponent from hitting the shuttlecock and dropping it in their own game during the game, then each player must try to keep the shuttlecock from touching the floor in their own playing area (Subarkah & Marani, 2020). It can be said that the game in the sport of badminton has the aim of scoring points and preventing the opponent from scoring points so that they can win the match. Therefore, the sport of badminton is a game that requires good physical, technical, tactical and mental abilities. Correct and accurate basic techniques are also one of the main factors in achieving achievements in badminton. A deep understanding and mastery of techniques such as hitting, smashing, and deceptive movements are very important to deal with various situations in the match. Failure to master these basic techniques can result in inaccuracy in playing, which in turn can affect the outcome of the match and hinder the development of athletes (Wardani, 2023). In particular, badminton aims to improve the performance that is capable of a person's quality that requires

good basic techniques, including smash, dropshot service which has aspects such as speed, agility, endurance, and strength (Endurance).

Related to Endurance is very important considering the relationship with basic badminton techniques which are in line with research (Rusdiyanto & Arief, 2023) This can be interpreted that cardiovascular endurance is one of the components that describes a person's level of Endurance that endurance training can improve a person's health and Endurance (NIH National Institute on Aging (NIA), 2021). It can be interpreted that increased endurance is directly related to increased Endurance. So it can be concluded that a person's Endurance level can be known based on their cardiovascular endurance achievements. Based on the survey results, it is known that the majority of students are easily tired every day, during sports activities, they take a long rest, and it was found that extracurricular teachers have never conducted a physical condition or physical endurance test on all Badminton extracurricular students which can be used as a benchmark in the level of physical improvement of Badminton extracurricular participants. In the Endurance problem above, it can be concluded that researchers will see the accuracy or target in the Badminton game. In addition, skill analysis can provide valuable insight into aspects of the game that need to be improved. Skills must also be observed frequently so that frequent mistakes can be identified and corrected through focused training.

Thus, the combination of good physical condition and strong basic techniques will help badminton players achieve optimal performance in every match. Research on the profile of badminton players' physical endurance and skill analysis in the game are important steps to understand the relationship between the two factors. By knowing the level of physical endurance and type of skills, coaches and athletes can then design a more effective training program. Based on the explanation above, this study aims to analyze and test endurance affecting the accuracy of dropshots and lobs in beginner badminton athletes at the Garut University badminton UKM players. The results of this study are expected to contribute to the development of more effective training strategies, as well as assist athletes in improving performance and achieving higher achievements.

Materials and Methods Study

Participants.

This research is a type of quantitative descriptive research because it is descriptive or descriptive of a situation. The number of samples obtained is n respondents. The population used is 20 badminton athletes and the analysis of accuracy in badminton games using

photos/videos by conducting manual accuracy analysis. For example, 20 UKM Badminton athletes at Garut University with a minimum of 1 year of experience. The technique used in this study is the non-probability sampling technique. In this study, the statistical analysis used is a descriptive technique with a percentage, and a normality test (Shapiro-Wilk) to determine the Level of Physical Endurance in students who participate in the UKM Badminton at Garut University.

Research Organization.

1. Multi Stage Running (Bleep Test)

- If the test is carried out outdoors, it should not be later than 11.00 WIB when the test takes place, because the heat of the sun will affect the test results.
- Check the speed of the cassette player using a one-minute calibration period and adjust the running distance if necessary (explained on the cassette and cassette manual). The speed of the cassette player is 60 seconds for a distance of 20 meters. - Measure the distance of the cassette check results and mark it with tape and a distance limiter.
- Play the rhythm tape.
- Instruct the students to run to the opposite end/finish and touch one foot behind the boundary line when the "tuut" sound is heard. If the student has arrived before the "tuut" sound is heard, the student must support the turning point, wait for the sound signal and then run towards the opposite line in order to reach it right when the next signal sounds .
- At the end of each minute, the time interval between two "tuut" sounds gets shorter, therefore, the running speed gets faster.
- Students must be able to reach the finish line at the specified time and not be late.
- Each student continues to run as long as possible so that the student can no longer catch the "tuut" sound signal from the recording tape. The criterion for stopping the student is if the student lags behind the "tuut" sound signal twice more than two steps behind the finish line.

2. Basic Badminton Game Techniques

a. Basic Dropshot Stroke Technique

The correct execution of a dropshot allows each player to display maximum performance, while displaying good abilities in every movement of the player and is

measured in the accuracy of the shuttlecock on the net. Here are the steps to perform a dropshot:

- Participants stand holding the racket between the center lines of the court, when the shuttlecock is touched, the arm must be straight, reach the shuttlecock and push with a soft touch.
- The shuttlecock is pushed slowly over the net, do not hit the shuttlecock (the shuttlecock is hit slowly/not with full power)
- Do a dropshot without making a sound.
- Pay attention to the final movement (follow through), do not immediately stop swinging the racket after touching the shuttlecock.
- An effective stroke is a stroke that falls close to the net.
- Opportunity to hit the shuttlecock with a drop shot 10 times.

b. Basic Lob Stroke Technique

- At a distance of 4.29 meters from the net, a 5-meter rope is stretched parallel to the net. In the service area of the court next to it, a Y mark is made as a place for the testee to start trying and an X mark as a place to hit. Feeder (A) provides an easy-to-hit shuttlecock with a service directed to the testee's court area and the testee hits the shuttlecock over the net and the boundary rope directed to the target area. If the testee cannot achieve the service well, the trial can be repeated.
- The testee gets the opportunity to hit the shuttlecock 20 times. The testee's score is the total score obtained from 20 hits. Shuttlecocks that fall on the boundary line are considered to be in an area with a higher score. For wild shuttlecocks from the feeder, the testee may not hit them, but if they are hit, it is counted as one hit. - This test has quite high objectivity, the assessment is done by changing the score into a scale value.

c. Basic Backhand & Overhead Stroke Techniques

- The target of the Backhand & Overhead stroke is the back of the opponent's court (Backboundary) .
- The test participant's position is in the middle of the Backboundary of the court .
- The test participant receives the pass and greets the pass with a Backhand & Overhead stroke, and is done 12 times then the 10 best strokes are taken. the ball is left and restarted if the pass does not reach $\frac{3}{4}$ of the field,
- The shot is declared good and gets a score if the Shuttlecock enters the target area .

Statistical analysis.

Data analysis is needed in the study of the level of physical endurance in students who participate in the Badminton UKM at Garut University, carried out using a quantitative descriptive method and using SPSS v.26. Data analysis to create a frequency distribution of physical conditions is carried out using a quantitative descriptive method referring to the Physical Endurance Test and knowing the correlation results for each indicator studied.

Results

Table 1 Data on Physical Endurance Test Results of UKM Badminton University of Garut

No	Name	Bleep Test		No	Name	Bleep Test		
1	Great	5.2	30	12	Gugun	4.3	24	
2	Agus	4.5	28	13	Gift	5.5	28	
3	Wise	5.2	30	14	Dani	6.8	31	
4	Eza	6.9	36	15	Paradise	7.5	36	
5	Wandi	3.7	26	16	Reza	5.1	38	
6	This	8.7	42	17	Alfie	10.1	30	
7	Faisal	9.2	44	18	Apip	5.6	47	
8	Ravi	5.4	31	19	Akmal	8.6	31	
9	Wow	7.8	39	20	Angga	7.2	42	
10	Jujun	4.1	26	Amount				677
11	Dicky	3.4	30	Average				34

Table 2 Frequency Distribution of Bleep Test

Category y	VO2max (ml/kg/min)			
	< 30	Test Results	31 – 39	40 – 49
Very Less	< 25.0	1	< 25.0	< 25.0
Not Enough	25.0 – 33.7	10	25.0 – 30.1	25.0 – 26.4
Currently	33.8 – 42.5	7	30.2 – 39.1	26.5 – 35.4
Good	42.6 – 51.5	2	39.2 – 48.0	35.5 – 45.0
Very Well	≥ 51.6	0	≥ 48.1	≥ 45.1

Table 3 DropShot Hit Frequency Distribution

No	Intervention	Category y	Frequency	Percentage
1	22 – 40	Good	15	75%
2	11 – 21	Medium	5	25%
3	0 – 10	Low	0	0%

Amount	20	100%
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Table 4 Lob Shot Frequency Distribution

No	Intervention	Category y	Frequency	Percentage
1	>71	Good	3	15%
2	41 – 70	Medium	14	70%
3	30 – 40	Low	3	15%
Amount			20	100%

Table 5 Backhand Stroke Frequency Distribution

No	Intervention	Category y	Frequency	Percentage
1	22 – 40	Good	13	65%
2	11 – 21	Medium	7	35%
3	1 – 10	Low	0	0%
Amount			20	100%

Table 6 Overhead Hit Frequency Distribution

No	Intervention	Category y	Frequency	Percentage
1	22 – 40	Good	20	100%
2	11 – 21	Medium	0	0%
3	1 – 10	Low	0	0%
Amount			20	100%

Table 7 One-Sample Kolmogorov-Smirnov Test Tests of Normality

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro Wilk		
	Stati stics	df	Sig.	Statisti cs	df	Sig.
Endurance	.215	20	.016	.943	20	.278
Skills	.123	20	.200 *	.968	20	.715
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Table 8 Correlation Analysis Data of Physical Endurance Variables and Basic Badminton Skills

	Religiosity	Aggressiven ess
Religiosity	1	
Pearson Correlation		-.188
Sig. (2-tailed)		.427 20

N		20	
Aggressiveness	Pearson Correlation	-.188	1
	Sig. (2-tailed)	.427	
N		20	20

Based on the results of the data correlation in the table above, it can be seen that the Correlation value of Endurance and Basic Skills of Badminton UKM Students of Garut University has no relationship, it can be seen from the significance results of $0.427 > 0.05$. Thus, the relationship between Physical Endurance (bleep test) and basic badminton skills is not correlated. Then to obtain the value of the relationship, the correlation value of the variable is obtained in the religiosity value with a value of (0.188), if included in the level of relationship, the obtained value is included in the category of a very low level of relationship. This is certainly a basic foundation that the level of basic badminton skills cannot be related to endurance or VO2 max. The acquisition of this value can be said that the relationship between Physical Endurance possessed by participants of Badminton UKM Garut University with basic badminton skills does not have a complementary level of connection, it can be seen in the previous table where the results of Endurance are equal to the level of basic skills possessed by each individual.

Discussion

Based on the results of the research on the level of physical endurance test of UKM Badminton students of Garut University, it was obtained that 0 students with a percentage (0%) had a very good level of endurance, 2 students with a percentage (10%) had a good level of endurance, 7 students with a percentage (35%) had a moderate level of endurance, 10 students with a percentage (50%) had a low level of endurance and 1 student with a percentage (5%) had a very low level of endurance. After looking at the results of the physical endurance test of UKM Badminton students of Garut University, totaling 20 people, they obtained a score of 677 points, so that the average result obtained in this physical endurance test was 34 points, thus the average result is included in the "Good" category. Furthermore, based on the results of the research on the basic badminton skills technique test, it was obtained that 17 students with a percentage (85%) had a good level of basic technique skills, 3 students with a percentage (15%) had a moderate level of basic technique skills, 0 students with a percentage (0%) had a low level of basic technique skills. After looking at the results of the basic badminton skills technique test of 20 Garut University Badminton UKM students,

they obtained 675 points, so that the average result obtained in this Physical Endurance test was 34 points, thus the average result is included in the "Good" category. Looking at the results of the Endurance Level against badminton skills at the UNIGA Badminton UKM as a whole shows that the Endurance Level has nothing to do with basic badminton skills techniques. The lack of Endurance level in players is caused by several factors, one of which is the implementation of training. Players should be given a training program adjusted to the goal, namely to improve the quality of the Physical Endurance Level possessed by the players. for example, training that aims to increase the player's running speed, the training program created is running for a short time.

Conclusions

If the training is not adjusted to the goal, the training goals will not be achieved adequately in each component of the Physical Endurance Level which is still relatively lacking. Other factors that will also affect the level of Physical Endurance of badminton UKM members include: lack of physical activity or training outside of training hours. Because by doing physical activity and sports properly, regularly and continuously it is useful in achieving optimal Physical Endurance status. By adding individual training, the body will also have enough energy and will be well trained. Good and correct training will have a big influence on every component of the body of each member with a good and correct training pattern, it will indirectly make it easier for each member to undergo routine training that is usually difficult to do. This finding is in line with Rusdiyanto & Arief (2023) that badminton techniques depend more on specific training than aerobic endurance. The sample taken was 20 people where this sample has limitations in beginner athletes, so it cannot be generalized to the elite athlete level.

Acknowledgement

We would like to express our deepest gratitude to the lecturers of the Physical Education and Sports study program, as those who guided, provided input, and supported us in completing this research.

Thank you to my parents, Mr. Asep Juhana and Mrs. Eulis Herawati for their endless support and prayers, both in terms of material. To Reza Fahlevi who always accommodates and listens to the author's complaints and finally to my fellow strugglers, Runi Nurdiana and Gugun Gunawan.

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