

The Relationship of Endurance and Agility with Badminton Playing Skills of Badminton Extracurricular Students at Sma N 1 Seyegan in the Academic Year 2019/2020

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ABSTRACT

This study aims to determine the relationship between endurance and agility with badminton playing skills of badminton extracurricular participants at SMA N 1 Seyegan in the 2019/2020 school year. This research is a correlational study. The population used were students who participated in extracurricular badminton at SMA N 1 Seyegan for the 2019/2020 academic year, totaling 31 students. the number of samples taken by purposive sample as many as 20 students. Data collection techniques using surveys, with data collection techniques using tests and measurements. The instrument used in this study was a multistage fitness test for endurance, a shuttle run for agility, and (round robin) for a badminton skill test. The data analysis technique uses regression and correlation analysis, both simple and multiple, through the prerequisite tests for normality and linearity. The results showed that: (1) there was a significant relationship between endurance and badminton playing skills with a contribution of 62.0%. (2) there is a significant relationship between agility and badminton playing skills with a contribution of 28.9%. (3) together there is a relationship between endurance and agility with badminton playing skills of extracurricular members of SMA N 1 Seyegan with a large contribution of 90.8%.

Keywords: endurance, agility, and badminton skills.

1. INTRODUCTION

Sport or physical activity is one way to keep physical fitness in good condition. Physical fitness is a person's ability to carry out types of physical activities that require strength, endurance, and flexibility [1]. Often seen men and women, young or old doing sports exercises both in the field and on the road. All of this they do so that health and physical fitness are maintained as the basis for a healthy life. The essence of sport is a physical activity that contains the nature of the game and contains a struggle against oneself or with others or confrontation with natural elements [2]. Sports by [3] that sports activities are very important for an athlete to achieve an achievement, routine fitness tests are carried out by athletes to find out where the athlete's shortcomings are and the best solution can be found.

One of the sports that is often played by all people is badminton. Badminton is played in almost every country in the world and has even been competed in the Olympics and has brought Indonesia's name to successfully pairing gold medals for the men's singles and women's singles for the first time on behalf of Alan Budi Kusuma and Susi Susanti. Badminton is one of the most popular sports in the world, including Indonesia. This can be seen by the large number of people who take part in every badminton sport activity that is held, both in the form of village-level matches to the

world level, such as the Thomas and Uber Cup or the Olympics.

According to [4] The definition of badminton is a game that can be played for individual or team numbers using rackets and shuttlecocks, which can be played in an open or closed field, limited by a net in the middle of the field. In line with the opinion above, the badminton game is hitting the ball or shuttlecock through the net so that it falls on the opponent's predetermined field of play and trying to prevent the opponent from doing the same with various hitting techniques ranging from relatively slow to very fast and accompanied by deceptive movements. This sport trains accuracy, accuracy and strategy in the game. Added according to [5] Badminton is a type of sport that is played using a net, a racket as a bat, a shuttlecock as an object to be hit.

In order to get optimal performance in the game of badminton, in addition to each player must have strength, speed, agility, flexibility, accuracy, endurance also must master the basic skills of playing. Mastery of basic skills is one of the efforts to increase higher achievement. The level of skill possessed by the players will determine their appearance in playing badminton because the appeal of badminton lies in the naturalness of the game. To achieve maximum performance requires good physical condition.

Physical is the foundation of sports achievement because technique, tactics and mentality can be developed properly if they have good physical qualities [6]. Physical condition is a requirement that must be possessed by an athlete in improving and developing optimal sports performance, so that all physical conditions must be developed and improved according to the characteristics, characteristics, and needs of each sport. [2]. Physical condition is a necessary requirement in improving an athlete's performance, and may even be regarded as a basic necessity that cannot be postponed or negotiable [7].

Increasing achievement cannot be separated from good athlete coaching, so coaching must start from coaching young people to the next level. The coaching of talented young athletes will determine the achievement of optimal quality achievements in badminton. The development of superior athletes requires processing and a fairly hard training process. The coaching of athletes is also supported by facilities and infrastructure as well as tournaments which are gradually and supported by research and science. Young talented athletes can be found in schools and clubs. Schools are well-organized institutions and organizations. All activities are planned and arranged according to the curriculum. To face the progress of the times, the educational curriculum is always being changed. improved and perfected so that what is given in school to their students can be used to face the challenges of life in the present and in the future, so that the school as a place to learn so that life goals or ideals are achieved. This applies to physical education subjects.

Physical education emphasizes aspects of comprehensive education, including health, physical fitness, movement skills, thinking skills, and moral actions. Physical education is a form of learning that uses physical activity, namely learning to move and learning through motion. Students are expected to have experience and good movement skills to achieve good mastery of movement skills, of course it takes more time and is done repeatedly. When referring to this, of course the physical education lessons provided by the school are very lacking, so the policy of holding sports extracurricular activities as physical activities is to increase students' experience in sports activities and it is hoped that with extracurricular activities students will excel.

Extracurricular activities can also form mental attitudes and dedication so that they can improve the performance of a particular sport for a longer time. according to [8] Extracurricular activities are additional activities at school which are generally carried out outside of class hours and this activity aims to make students further deepen and develop what is learned during the learning process in class and can develop students' interests and talents. One of the schools that organizes badminton extracurricular activities is SMA N 1 Seyegan. The activity is carried out on the badminton court of SMA N 1 Seyegan every Saturday at 10.00-12.00 WIB. Extracurricular activities are fostered by Mr. Doby and Mr. Anton as trainers and in charge Mr. Fajar Gunawan S.Pd., Drs. Agung Pramono and Yuli Karnomo, S.Pd as physical education teachers at SMA N 1 Seyegan.

Coaches also play a very important role in improving the badminton achievements of their students, both as a team and individually, because at SMA N 1 Seyegan, students' skills in playing badminton are still low. At the time of observing the students' playing practice process, most of the students still often made mistakes in badminton games such as the technique of holding a racket, serving, hitting backhand and smash. However, there are also some students whose badminton playing techniques can be said to be good.

The endurance of the extracurricular participants also varies, some can be said to be good and some are not. And the agility possessed by each student is also still different, some have good agility and some have poor agility. This is emphasized [9] that agility is the ability to change the direction or position of the body quickly which is done together with other movements. The agility component includes elements of dodging quickly, changing body position precisely, moving on and avoiding opponents quickly according to [10] that endurance is the ability of a person to move with his whole body for a long time and with a moderate to fast tempo without any significant feeling of fatigue. In line with the above opinion, endurance is the ability to work or train for a long time without experiencing fatigue [11]. General endurance is related to cardiovascular endurance. The term endurance or endurance in the world of sports is known as the ability of an athlete's organ equipment to fight fatigue during an activity or work. Understanding endurance in terms of muscle work is the ability to work muscles or a group within a certain period of time, while the understanding of endurance from the energy system is the ability to work organs of the body within a certain period of time.

Based on field observations, the endurance of students participating in badminton extracurricular when playing badminton is still a lot of students who are only strong in one set, so it can be said that the endurance of these students is not ideal as badminton players. And in terms of the agility of the students participating in the extracurricular badminton when returning the shuttlecock is still slow, so it can be said that the students participating in the extracurricular badminton in terms of agility are still not good, so that it can affect the badminton game.

A badminton player must have good endurance and agility so that it is easy to win the game. [12] stating the agility of a player who has good agility has several advantages, including: Easy to perform difficult movements, not easy to fall or injury, and supports the techniques used. The characteristics of agility can be seen from the ability to move quickly and when changing direction and position when playing. Endurance and agility can be prepared by a coach when carrying out an exercise program. In every training activity, the trainer has prepared a training program that will be taught such as racket holding techniques, service exercises, dropshots, drive strokes, forehand backhand strokes and physical exercises. Based on the statement above, the researcher only wanted to find out how big the relationship between endurance and agility was with the badminton playing skills of students who took badminton

extracurricular activities at SMA N 1 Seyegan in the 2019/2020 school year.

2. METHODS

This type of research is included in the type of correlational research. Correlational research aims to find out whether there is a relationship and if there is, how close the relationship is and whether or not the relationship is meaningful [13]. The method used in this research is a survey method with test and measurement techniques.

This research was conducted at SMA N 1 Seyegan which is located at Tegalgentan, Margoagung, Kec. Seyegan, Kab. Sleman, Special Region of Yogyakarta. This research was conducted on January 12-February 29, 2020. Data collection was carried out every Saturday during research and was carried out during extracurricular hours from 10.00 to finish. The subjects used were badminton extracurricular participants at SMA N 1 Seyegan.

According to [14] population is defined as an area of generalization concerning objects and subjects that have certain qualities and characteristics determined by researchers to be studied and conclusions drawn. In this study, the population taken was badminton extracurricular participants, totaling 31 people.

The sample is part of the number and characteristics possessed by the population, [15]. In this study the technique used in sampling is purposive sampling (purpose) sampling technique with certain considerations. The sample of this study used a wall volley test for 30 seconds by obtaining a minimum of 30 strokes with the aim of separating students who were better in their badminton playing skills. The best samples were taken from male students who took part in badminton extracurricular at SMA N 1 Seyegan, as many as 20 testes out of a total of 31 extracurricular participants.

3. RESULT

3.1 Summary of Previous Reserach

The data description will describe the maximum value, minimum value. The following is a description of the data obtained from the research subjects:

3.1.1 Durability

Endurance is denoted by XX_1 , endurance is obtained with a minimum VO_2 Max of 34.3 and a maximum value of 46.2. The following are the results obtained by students participating in extracurricular activities:

Table 1. Multistage Fitness Test

No	Name	Level	return	Vo2 Max
1.	AR	8	9	42.7
2.	WJ	9	9	46.2
3.	A A	9	3	44.2
4.	GB	7	10	39.9
5.	MV	8	1	40.2
6.	IH	8	5	41.4
7.	GA	6	7	35.3
8.	IZ	9	2	43.9

9.	MD	6	4	34.3
10.	MH	9	1	43.6
11.	MP	6	6	35.0
12.	MS	6	7	35.3
13.	MDP	6	6	35.0
14.	NH	6	8	35.7
15.	NHJ	9	5	44.8
16.	SP	9	6	45.2
17.	YES	8	4	41.1
18.	AFM	8	3	40.8
19.	DF	8	11	43.3
20	DNR	8	8	42.4

3.1.2 Agility

Agility is symbolized by XX_2 the minimum agility data is 11 and the maximum score is 15. The following are the results obtained by extracurricular students:

Table 2. Shuttle Run Test Results

No	Name	Agility Results
1.	AR	13
2.	WJ	15
3.	A A	14
4.	GB	11
5.	MV	12
6.	IH	13
7.	GH	12
8.	IZ	14
9.	MD	12
10.	MH	14
11.	MP	12
12.	MS	12
13.	MDP	11
14.	NH	12
15.	NHJ	15
16.	SP	15
17.	YES	12
18.	AFM	12
19.	DF	14
20	DNR	13

3.1.3 Badminton Playing Skills

The skill of playing badminton is symbolized by Y, the skill of playing badminton can be determined by playing badminton using a half competition system (round robin) to meet each other, the highest score being the top rank. The rules of the game use the PBSI rules. Assessment uses game points 21 and only 1 set. Based on the data obtained from the badminton playing skills test, it can be seen that the description analysis is as follows: a minimum score of 248 and a maximum score of 399.

Before carrying out statistical analysis, first the assumption test or analysis prerequisite test which includes normality test and linearity test is carried out. The use of the normality test to determine whether the distribution of the data obtained is normal or not, while the use of the linearity test is to determine whether the independent variables used

as predictors have a linear relationship or not with the related variables.

3.1.4 Normality test

To find out the normality, it is seen from Sig in the Kolmogorov-Smirnov column, if sig > 0.05 then the data is normally distributed. From the results above, it can be seen that the KSZ value is 549 and Asymp.sig is 0.924 which is greater than 0.05, so it can be concluded that the data is normally distributed. Normal data because the value of sig. > 0.05.

3.1.5 Linearity Test

Linearity test is used to determine the form of the regression line equation between the independent variables and the related variables. In this test will test the null hypothesis (H_0) that the form of linear regression. The criterion is "If Sig. Deviation from Linearity is greater than or equal to the significance level used (0.05) which means that it is linearly correlated.

3.1.6 Correlation Test

The coefficient of correlation value is the result of calculations using Pearson's formula to determine whether or not there is a significant relationship between two variables, in this study the correlation values obtained are:

There is a relationship between endurance and badminton playing skills because of the sig value. $0.000 < 0.05$.
 There is a relationship between agility and badminton playing skills because the value of sig. $0.000 < 0.05$.
 There is a relationship between endurance and agility with playing skills because of the value of sig. $0.000 < 0.05$.

3.1.7 Linear Regression Test

- a. Simple Linear Regression X1 with Y

Table 3. Simple Linear Regression Endurance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.937 a	.878	.871	18,396

a. Predictors: (Constant), Endurance
 The effect of endurance on badminton playing skills is 0.878 (87.8%).

ANOVAa

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	43671.365	1	43671.365	129,053	.000b
1 Residual	6091.185	18	338,399		
Total	49762,550	19			

- a. Dependent Variable: Badminton Playing Skills
- b. Predictors: (Constant), Endurance

Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-	43,085		-3.606	.002
Durability	155.366	1.059	.937	11.360	.000

a. Dependent Variable: Badminton Playing Skills
 There is an effect of endurance on badminton playing skills because of the sig value. $0.000 < 0.05$.

- b. Simple Linear Regression X2 with Y

Table 4. Simple Linear Regression Agility

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.884 a	.782	.770	24,547

a. Predictors: (Constant), Agility
 The effect of agility on badminton playing skills is 0.782 (78.2%).

ANOVAa

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	38916,243	1	38916,243	64,583	.000b
1 Residual	10846,307	18	602.573		
Total	49762,550	19			

- a. Dependent Variable: Badminton Playing Skills
- b. Predictors: (Constant), Agility.

Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-	53,944		-	.082
Agility	99,415	4.176	.884	1.843	.000

a. Dependent Variable: Badminton Playing Skills
 There is an influence of agility on badminton playing skills because the value of sig. $0.000 < 0.05$.

3.1.8 Multiple Linear Regression

Proving that there is a relationship between height and agility together on badminton playing skills with multiple regression tests are as follows:

Table 5. Multiple Linear Regression

Table 6. Effective Contribution

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.953 a	.908	.898	16,377

a. Predictors: (Constant), Agility, Endurance
The effect of endurance and agility on badminton playing skills is 0.908 (90.8%).

ANOVAa

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	45202,921	2	22601.460	84,267	.000b
Residual	4559,629	17	268,213		
Total	49762,550	19			

a. Dependent Variable: Badminton Playing Skills
b. Predictors: (Constant), Agility, Endurance

Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-171.382	38.939		-4.401	.000
Durability	8,491	1,754	.661	4,841	.000
Agility	12,390	5.185	.326	2,390	.029

a. Dependent Variable: Badminton Playing Skills
There is an effect of endurance on badminton playing skills because of the sig value. 0.000 < 0.05.
There is an influence of agility on badminton playing skills because the value of sig. 0.029 < 0.05. There is an effect if the GIS value. < 0.05.

After analyzing the data, the regression equation obtained from the constants and coefficients of the variable height and agility with badminton playing skills (X1, X2 with Y) in the table above is a multiple regression equation model: $Y = -171.382 + 8.491X1 + 12.390X2$.

3.1.9 Effective Donations and Donations

a. Effective Donation

Based on the results of the regression analysis conducted, all independent variables have a relationship with the dependent variable of 90.8% in students who take extracurricular activities at SMA N 1 Seyegan. Thus the magnitude of the effective contribution of the predictor can be seen as follows:

Ability	B	Cross product	Regression	Donations
				Total Effective
Durability	8,491	3631,545	45202,921	90.8%
Agility	12.39	1159.55		

From the table above, the results of the effective contribution are as follows:

$$SE_{endurance} = \frac{8,491 \times 3631,545}{45202,921} \times 100\% = 62.0\% \quad (1)$$

$$SE_{agility} = \frac{12,39 \times 1159,55}{45202,921} \times 100\% = 28.9\% \quad (2)$$

Based on the above calculation, the two variables contributed 90.8%. In detail, the contribution of each variable from endurance is 62.0%, agility is 28.9% for a total of 90.8%. This means that the ability to play badminton is influenced by both variables in this study.

b. Relative Contribution

When the effective contribution is known then find the relative contribution of each predictor is as follows:

$$SR_{endurance} = \frac{62,0 \times 100\%}{90,8\%} = 68\% \quad (3)$$

$$SR_{agility} = \frac{28,9 \times 100\%}{90,8\%} = 32\% \quad (4)$$

Based on the above calculation, in detail the contribution of each variable from endurance is 68% and agility is 32%, thus the total relative contribution is 100%.

4. DISCUSSION

Based on the calculation results, the relationship between height and agility with badminton playing skills is as follows: There is a significant relationship between endurance and badminton playing skills. Based on the independent variable, endurance and the dependent variable, badminton playing skills have a significant relationship with students who take badminton extracurricular activities at SMA N 1 Seyegan. Students who have good endurance greatly affect the skills of playing badminton because badminton requires various abilities and complex movements, such as sprinting, stopping suddenly and immediately moving again, jumping motion, reaching out, turning the body quickly. Movements like that must be done repeatedly as a result of the movement process will cause

fatigue, a badminton player who has good endurance will not easily experience fatigue.

There is a significant relationship between agility and badminton playing skills. Based on the results of the analysis of the independent variable agility and the dependent variable playing badminton skills have a significant relationship on students who take badminton extracurricular. According to the results of research I did at SMA N 1 Seyegan, students who had good agility won more matches than students who had poor agility. Because in badminton, agility is used to move quickly to reach the shuttlecock that is far from the body position.

- a. There is a significant relationship between endurance and agility with badminton playing skills. Based on the results of the analysis of the independent variables, endurance and agility with the dependent variable, badminton playing skills have a significant relationship with students who take badminton extracurricular activities. Badminton skills are the skills of a badminton player in using the physical, technical, tactical, and other elements possessed by a badminton player. Based on the research I did at SMA N 1 Seyegan. In this case endurance is very important, because the better a person's endurance, the less easily fatigued. On the other hand, agility is also very influential in playing badminton, at SMA N 1 Seyegan students who have good agility.

5. CONCLUSION

Based on the results of data analysis and discussion, the following conclusions can be drawn:

- a. There is a significant relationship between endurance and badminton skills for the badminton extracurricular members of SMA N 1 Seyegan, the relationship contributes 62.0%.
- b. There is a significant relationship between agility and badminton skills for the badminton extracurricular members of SMA N 1 Seyegan, the relationship contributes 28.9%.
- c. There is a significant relationship between endurance and agility with badminton playing skills of badminton extracurricular members of SMA N 1 Seyegan from the relationship between the two which contributed 90.8%.

There are several suggestions that need to be conveyed in connection with the results of this study, including:

- a. For teachers or coaches of badminton extracurricular at SMA N 1 Seyegan, the results of this study can be used as guidelines in the implementation of the process of badminton activities that can be used as benchmarks to improve achievement in badminton but do not forget to also pay attention to other factors that can improve badminton playing skills.
- b. For badminton extracurricular participants at SMA N 1 Seyegan, they should increase their training even more

actively to improve their badminton playing skills so that their achievements will increase.

- c. For the next research to be able to conduct research on badminton playing skills by replacing or adding other independent variables, and also expanding the scope of research.

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