

# The Effect of Physical Conditions and Concentration of Elementary Students to the Services Capabilities in Badminton Games

Hasbunallah<sup>1</sup>, Hasyim<sup>2</sup>

<sup>1,2</sup> (Faculty of Sport Science Education, Universitas Negeri Makassar, Indonesia)

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## **Abstract:**

Services capability in Badminton Games is the one target of sports education for Elementary School in Indonesia. This study are (1) To find out whether there is a contribution of physical condition to the ability to service in badminton games for students. (2) To find out whether there is a concentration contribution to the ability to service in badminton for students. (3) To find out whether there is a joint contribution between physical conditions and concentration on the ability to service in badminton games for students. The researchers involved 90 elementary students in 5th grade. Analysis of data used descriptive statistics and correlation by regression. The study resulted that there is a significant correlation between physical condition and student concentration to their services capability in Badminton games. Simple linear regression found that physical condition contributes 68% to the student's ability. At the same time, the contribution is 71.1%. The multiple regression resulted in two variables contributing simultaneously to the student's capabilities with a contribution value of 75.8 %.

**Key Word:** Eye-hand, coordination, flexibility, concentration

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## **I. Introduction**

Badminton is one of the most famous sports in the world. This sport attracts various age groups, different levels of skill, and men or women can play this sport indoors or outdoors for recreation as well as a competition. Badminton shuttlecock is not reflected and has to play in the air, so this game is a fast game that requires good reflexes and a high level of fitness ground.

The service blow is the first shot that starts a badminton game. It can be done with the forehand and backhand. The main serve stroke in a single match is a high and backward fall. However, it must be admitted that nowadays, there is a tendency for many single players to use short serves to avoid attacks from attacking-type opponents. But a player who wants to have good and accurate service must have the ability to support good and accurate service. One of the most important things in producing good and accurate service is the element of physical ability, apart from technical, mental, and skill.

Servicing is the first blow to start the game of badminton. The first serve ball is crucial to be able to get points and win a match, also serve done after the ball is dead. The service blow was the first blow that started a badminton game, and after that, we do a blow from the top of the head [1]. Short service is a service by directing the shuttlecock with the aim of both targets: to the point of intersection between the service line in front of the center line and the service line with the edge, while the path of the shuttlecock is thin along with the net [2]. Coordination is the body's ability to integrate different movements into a single, harmonious, and effective movement. Almost all athletes from various sports need this coordination component. The coordination component together with the balance component forms the ability to stand, run, jump, kick, throw or other basic human movements [3]. All movements must be controllable by sight and must be precise, following the planned sequence in mind.

Eye-hand coordination in badminton is the key to success in winning the winning numbers because once the badminton game is started. Once a player serves as an opening game between hands, the shuttlecock and the eye must always be in contact so that the punch can be placed in the direction that is difficult to reach by opponents.

Flexibility in sports usually refers to the joint space or joints of the body. The flexibility of a person is determined by the extent of the narrow stretch of his joints. In the game of badminton, flexibility also has an important role [4]. With better flexibility, a badminton player will be able to move more swiftly. When servicing, wrist flexion helps service success. In the follow-through phase in the service stroke, the wrist flexing provides the final push or control. Concentration is the ability to focus attention on tasks without being interrupted and influenced by external and internal stimuli. The term concentration is often exchanged with the

term attention, which is a condition in which a person's consciousness is directed to a certain object at a certain time [5].

At the elementary school level observation, the difficulty students often experience is the mastery of basic techniques, especially in the stroke service method. It can be seen when playing some students who have hard and accurate service punches. Even so, there are still players who are not quite right in serving the punches so that the shuttlecock leaves the field. Accurate stroke service must be supported by excellent physical abilities, especially eye hand coordination, wrist flexion, and psychological factors, namely concentration.

## II. Material And Methods

The research tries to find the relation of physical conditions and concentration on the short serviceability in the badminton game for elementary students. This study uses 90 students of SD Inpres Perumnas Antang I Makassar as samples taken with purposive sampling because the chosen students are being taught about the badminton game. This research method is qualitative research focusing on two independent variables and one dependent variable with the physical condition (eye-hand coordination and wrist flexibility) and concentration. In contrast, the dependent variable is short serviceability. The sample is a withdrawal from a portion of the population to represent the entire population. Then the sample is tested with the instruments. The data are analyzed by applying the statistical descriptive and the statistical inference

## III. Result

### Descriptive Analysis of Variables

Based on the table 1, the average score for physical condition is 100.0010 and that of concentration is 121.50. Meanwhile, the average score for short service ability is only 21.90. The standard deviation for physical condition is relatively the highest among concentration and short service ability. It is 17.61258 for physical condition while it is 2.825 and 2.482 for concentration and short service ability respectively. The maximum score is 129.81 for physical condition and 127 for concentration. The minimum score takes half of the maximum score for physical condition, which is 61.42. But, it does not happen for concentration and short service ability. They are 11 and 10 respectively.

Table no 1 : Descriptive Analysis of Variables

		Statistics		
		Physical condition	Concentration	Short Service Ability
N	Valid	90	90	90
	Missing	0	0	0
Mean		100.0010	121.50	21.90
Std. Error of Mean		3.21560	.516	.453
Std. Deviation		17.61258	2.825	2.482
Variance		310.203	7.983	6.162
Range		68.39	11	10
Minimum		61.42	116	17
Maximum		129.81	127	27
Sum		3000.03	3645	657
Percentiles	25	85.4600	119.00	20.00
	50	99.9950	121.00	22.00
	75	117.8250	124.00	24.00

The results of the physical condition on the 90 students are presented in Figure 1.

Physical Condition Category

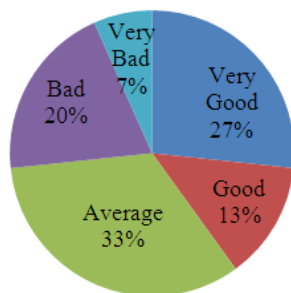
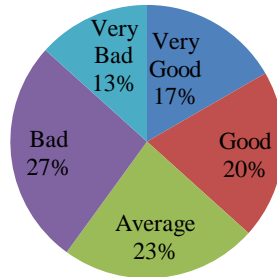


Figure no 1 : Percentage of physical condition categories

The results of the concentration on the 90 students are presented in Figure 2.

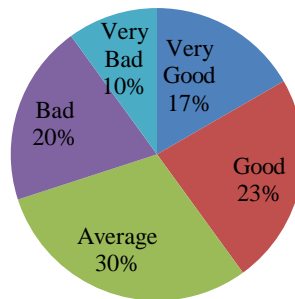
**Concentration Category**



**Figure no 2** : Percentage of concentration categories

The results of the short service ability on the 90 students are presented in Figure 3

**Short Service Ability Category**



**Figure no 3** : Percentage of short service ability categories

**Statistical Analysis**

There is a contribution of physical condition to the short service ability in the badminton game of elementary school. The statical analysis of contribution of the physical condition to the short service ability are showed in table 1 and table 2.

H0: The means of physical condition and short service ability are equal ( $\mu_1 = \mu_2$ )

H1: The means of physical condition and short service ability are not equal ( $\mu_1 \neq \mu_2$ )

**Table no 2** : Physical condition contribution to the short service ability

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	122.494	1	122.494	61.022	.000 <sup>b</sup>
	Residual	56.206	28	2.007		
	Total	178.700	29			

a. Dependent Variable: Short Service Ability

b. Predictors: (Constant), Physical Ability

The table 2 shows the output of the analysis and whether there is a statistically significant difference between our group means. In the table, we can see that the significance value is 0.000 (i.e.,  $p = .000$ ), which is below 0.05. Thus, H0 is rejected and H1 is accepted or the regression coefficient is significant or the physical codition has a significant contribution to the ability of short service in the badminton game of elementary school students. Therefore, there is a statistically significant difference in the means of physical condition and short service ability.

Regression analysis is used to examine how much the influence independent variables (X), physical condition, to the dependent variable (Y), short service ability. The formulation of the regression model is

$$Y = a + bX$$

H0 = regression between Y and X are significant

H1 = regression between Y and X are insignificant

**Table no 3 : Regression analysis of physical condition to the short service ability**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	10.231	1.516		6.748	.000
Physical condition	.117	.015	.828	7.812	.000

a. Dependent Variable: Short Service Ability

The table 3 reveals that the regression model forecasts the dependent variable, short service ability, well. By using significant level,  $\alpha$ , is equal to 5%. As we can see,  $p = 0.000$ , which is less than 0.05. It suggests that not enough data to reject H1. The regression model undoubtedly forecasts the outcome variable. In the table, we can see the B-value for constant is 10.231 and coefficient of physical condition is 0.117. Thus, the model can be expressed as follow

$$Y = 10.231 + 0.117X$$

The measures of association table to convey the influence of physical condition to the short service ability can be seen in the table 3. The effect is informed from the value of R Square

**Table no 4 : The influence of physical condition to the short service ability**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.828 <sup>a</sup>	.685	.674	1.417

a. Predictors: (Constant), Physical Ability

From the table 4 above the R Square value is 0.685. This value means that the magnitude of the influence of concentration (X) is 68.5%. Meanwhile, the other 31.5% is affected from the other variables which we do not study

### Contribution of concentration to the short service ability

There is a concentration contribution to the short service ability in the badminton game of elementary students. The stactical analysis of contribution of the concentration to the short service ability are showed in table 4 and table 5.

H0: The means of concentration and short service ability are equal ( $\mu_1 = \mu_2$ )

H1: The means of concentration and short service ability are not equal ( $\mu_1 \neq \mu_2$ )

**Table no 5 : Concentration contribution to the short service ability**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	127.051	1	127.051	68.877	.000 <sup>b</sup>
	Residual	51.649	28	1.845		
	Total	178.700	29			

a. Dependent Variable: short service ability

b. Predictors: (Constant), concentration

The table 5 shows the output of the ANOVA analysis and whether there is a statistically significant difference between our group means. In the table, we can see that the significance value is 0.000 (i.e.,  $p = .000$ ), which is below 0.05. Thus, H0 is rejected and H1 is accepted or the regression coefficient is significant or the concetration has a significant contribution to the ability of short service in the badminton game of elementary school students. Therefore, there is a statistically significant difference in the means of concentration and short service ability.

Regression analysis is used to examine how much the influence of independent variables (X), concentration, to the dependent variable (Y), short service ability. The formulation of the regression model is

$$Y = a + bX$$

H0 = regression between Y and X are significant

H1 = regression between Y and X are insignificant

**Table no 6 :** Regression analysis of concentration to the short service ability

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-68.11	10.848		-6.28	.000
Concentration	.741	.089	.843	8.299	.000

a. Dependent Variable: Short Service Ability

The table 6 reveals that the regression model forecasts the dependent variable, short service ability, well. By using the significant level,  $\alpha$  is equal to 5%. As we can see, p is equal to 0.000, which is less than 0.05. It suggests that not enough data to reject H1. The regression model undoubtedly forecasts the outcome variable. In the table, we can see the B-value for constant is -68.11 and coefficient of physical condition is 0.741. Thus, the model can be expressed as follow:

$$Y = -68.11 + 0.741X$$

The measures of association table to convey the influence of concentration to the short service ability can be seen in the table 6. The effect is informed from the value of R Square.

**Table no 7 :** The influence of concentration to the short service ability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.843 <sup>a</sup>	.711	.701	1.358

a. Predictors: (Constant), Concentration

From the table 7 above the R Square value is 0.711. This value means that the magnitude of the influence of concentration (X) is 71.1%. Meanwhile, the other 28.9% is affected from the other variables which we do not study.

**Contribution of physical condition and concentration to the short service ability**

There is a contribution of physical condition and concentration together to the ability to service short in the badminton game of elementary students. The statistical analysis of contribution of the concentration to the short service ability are showed in table 7 and table 8.

H0: The means of concentration and short service ability are equal ( $\mu_1 = \mu_2$ )

H1: The means of concentration and short service ability are not equal ( $\mu_1 \neq \mu_2$ )

**Table no 8 :** Physical condition and concentration contribution to the short service ability

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	135.536	2	67.768	42.390	.000 <sup>b</sup>
	Residual	43.164	27	1.599		
	Total	178.700	29			

a. Dependent Variable: Short service ability

b. Predictors: (Constant), Physical Condition, Concentration

The table 8 shows the output of the ANOVA analysis and whether there is a statistically significant difference between our group means. In the table, we can see that the significance value is 0.000 (i.e.,  $p = .000$ ), which is below 0.05. Thus, H0 is rejected and H1 is accepted or the regression coefficient is significant or the physical condition and concentration have a significant contribution to the ability of short service in the badminton game of elementary school students. Therefore, there is a statistically significant difference in the means of physical condition, concentration, and short service ability.

Regression analysis is used to examine how much the influence of independent variables (X1 and X2), physical condition and concentration, to the dependent variable (Y), short service ability. The formulation of the regression model is:

$$Y = a + b1X1 + b2X2$$

H0 = regression between Y, X1, and X2 are significant

H1 = regression between Y, X1, and X2 are insignificant

**Table no 9 :** Regression analysis of physical condition and concentration contribution to the short service ability

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-37.39	16.727		-2.24	.034
Physical Condition	.057	.025	.405	2.304	.029
Concentration	.441	.154	.502	2.856	.008

The table 9 reveals that the regression model forecasts the dependent variable, short service ability, well. By using the significant level,  $\alpha$  is equal to 5%. As we can see, p-values are equal to 0.034, 0.029, and 0.008. All of them are less than 0.05. It suggests that not enough data to reject H1. The regression model undoubtedly forecasts the outcome variable. In the table, we can see the B-value for constant is -37.390, coefficient of physical condition is 0.057, along with the coefficient of concentration is 0.441. Thus, the model can be expressed as follow:

$$Y = -37.39 + 0.057X_1 + 0.441X_2$$

The measures of association table to convey the influence of physical condition and concentration to the short service ability can be seen in the table 10. The influence is informed from the value of R Square

**Table no 10** : The influence of concentration to the short service ability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.871 <sup>a</sup>	.758	.741	1.264

a. Predictors: (Constant), Concentration, Physical Condition

From the table 10 above the R Square value is 0.758. This value means that the magnitude of the influence of physical condition (X1) and concentration (X2) are 75.8%. Meanwhile, the other 24.2% is affected from the other variables which we do not study. The results of the statistical analysis showed that there was a contribution of physical condition to the ability of short service in the badminton game of students of SD Inpres Perumnas Antang Makassar. If the results of this study are linked to the theoretical foundation and the underlying mindset, the results of this study support and strengthen the theories and results of previous research that already exist. This proves that physical condition (eye hand coordination and wrist flexion) affects short service abilities in badminton. Coordination is the ability to make movements or work properly and efficiently. Eye-hand coordination is the movement that occurs from information that is integrated into limb movements. All movements must be controllable by sight and must be precise, in accordance with the planned sequence in mind [6].

The results of the statistical analysis showed that there was a concentration contribution to the short service ability in the badminton game SD Inpres Perumnas Antang Makassar. If the results of this study are related to the theoretical basis and the underlying mind-set, the results of this study support and strengthen the theories and results of previous research that already exist. Moran said that concentration is a constant change related to the two broad dimensions and the dimensions of focus. While concentration is the ability to focus attention on tasks that are not interrupted and are influenced by external and internal stimuli [7].

The results of statistical analysis showed that there was a contribution of physical condition and concentration. This study support and strengthen the theories and results of previous research that already exist. This proves that the physical condition and psychological aspects of concentration affect the ability to service short in badminton games [8]. The higher the quality of the techniques students have to master, the greater the physical needs needed. an element of physical condition consisting of eye coordination and wrist flexion.

The ability of students to serve is very diverse in the placement of shuttlecocks where the main key in the implementation phase of service is concentration. If the student has good concentration, the student has a focus on placing the shuttlecock area so that it easily crosses the shuttlecock to the hardest area so the service recipient is unable to return the shuttlecock properly. Based on the explanation above, both physical condition and concentration are considered to have contributed to the ability of short service in badminton games.

#### IV. Conclusion

The results showed that the behavior of farmers in post-harvest management is not suitable for the three aspects of sustainable development. The three aspects are harvesting, drying, and cleaning. While the packaging, transportation and storage were suitable for sustainable development concepts. The result of probability analysis shows the value that indicates that all factors influence farmers' behavior. Furthermore, the attitudinal factor shows the highest correlation with the behavior of farmers in post-harvest management

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