

Original Article Research

Eye-Hand Coordination and Agility with Basketball Lay-Up Skills: A Correlation Study in Students

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Received: 04/02/2023

Revised: 22/05/2023

Accepted: 31/05/2023

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Abstract

The skill of *laying up* a basketball is one of the important techniques that plays a role in giving pounds or numbers in the game. Therefore, it is necessary to know aspects related to lay up skills. This study aims to prove the relationship between eye-hand coordination and agility with basketball lay-up skills. In this study, a quantitative descriptive approach was used with the correlation study method. The subjects in this study were male students of class VII SMP St. Francis of Assisi Pontianak, totaling 25 male students. Data analysis in this study was assisted by using SPSS Version 26. Results of eye-hand coordination research with lay-up skills showing a significance value of $0.000 > 0.05$, there is a significant relationship between eye-hand coordination and lay-up skills in students. agility results with lay-up skills showing a significance value of $0.004 > 0.05$, there is a significant relationship between agility and lay-up skills in students. Furthermore, eye-hand coordination and agility with lay-up skills show a significance value of $0.000 < 0.05$, so there is a significant relationship. The conclusion is that eye-hand coordination and agility have a significant relationship to lay-up skills in students.

Keywords : Agility, Basketball, Hand-Eye Coordination, Lay Up Skills

How to cite:

Suryadi, D., Suganda, M. A., Samodra, Y. T. J., Wati, I. D. P., Rubiyatno, R., Haïdara, Y., Wahyudi, I., & Saputra, E. (2023). Eye-Hand Coordination and Agility with Basketball Lay-Up Skills: A Correlation Study in Students. *JUMORA: Jurnal Moderasi Olahraga*, 3(1), 60-71. <https://doi.org/10.53863/mor.v3i1.681>

1. INTRODUCTION

The education sector, especially PJOK learning, which is an integral part of national development, also needs serious attention. The government's efforts to make physical education a vehicle for achieving National Education goals (Mustafa & Dwiyo, 2020). Where, PJOK learning is one of the subjects given to students starting from the Elementary School level up to High School (Rubiyatno & Suryadi, 2022). The purpose in the learning process is to shape the personality of students through physical activities in affective, cognitive, and psychomotor aspects (Munir et al., 2021). In addition, PJOK learning is used to stimulate motor skills, thinking skills, emotional, social, moral and physical development and growth (Faqih, 2017).

Based on that, PJOK learning is a strategic subject in developing student personality. The strategic meaning is that the personality aspects developed by physical education are more complete when compared to other subjects, namely aspects of knowledge, attitudes and skills. Furthermore, PJOK learning in schools can encourage student development, especially maintaining physical fitness (Faqih, 2017; Masrul, 2019). This statement is reinforced by the increase in physical fitness after carrying out physical activity through sports activities (Hayudi & Pratama, 2019; Purba et al., 2020; Suryadi, 2022; Suryadi et al., 2021; Suryadi & Rubiyatno, 2022; Syahputra et al., 2017). In addition, PJOK learning includes affective, cognitive, and psychomotor aspects (Mustafa, 2021; Purwaningtyas et al., 2016) . Thus PJOK learning in schools aims to help students improve physical fitness and health through the introduction and cultivation of positive attitudes, as well as basic movement skills and physical activity. One of the materials taught is the sport of basketball.

The game of basketball is a basic game sport that is included in the subject matter of PJOK subjects (Suryadi et al., 2022). Where in this game requires high skill and physical fitness (Yuan et al., 2021) , and also requires good speed in the game (Daulatabad et al., 2020). In addition, basketball is a type of sport played by two opposing teams with the aim of putting the ball into the opponent's basket (Wanena, 2018). Having complex movements (Aditya Dwitama, 2018), makes this sport demanding speed, strength, agility and flexibility, thus ultimately providing increased development of broader movement skills for the players. To be able to play basketball, students must master the basic techniques of the game, including *dribbling, passing, pivots, shooting, Lay up*, and *Lay up Shoot* (Yulianto, 2018) . The skill of *laying up* a basketball is a must for players to learn, where this plays an important role in making it easier to attack the opponent's area (Suryadi et al., 2022).

Based on these reviews, it illustrates that in order to play basketball well students must really master the basic techniques of playing basketball. In addition, each player also requires agility and accuracy. A study says, to achieve success in *laying up* in basketball games one should also pay attention to the player's height and dynamic balance (Suryadi et al., 2022). The lack of enthusiasm of students in PJOK lessons requires attention (Novitasari & Setiyo Hartoto, 2020), so that teachers also have an important role in sports (Suryadi et al., 2023). Based on a

preliminary study conducted through interviews with PJOK teachers and observations that St. Francis Assisi Middle School, Pontianak, where many students play basketball during recess. However, there are not many students who do not know the supporting elements of the *lay-up movement* in the basketball game.

Although several previous articles proved that there was a relationship between hand-eye coordination and basketball lay-up skills (Candra, 2020;Wiyaka et al., 2019), further research by Idris et al., (2023) found that agility can affect lay ability . up shoot. However, no research has been found that combines the correlation of hand-eye coordination and agility with lay-up skills in basketball. So that this becomes an important study where researchers will get a new understanding from the results of this study. Based on this statement, this study aims to prove the correlation between hand-eye coordination and agility with basketball lay-up skills.

2. METHODS

2.1 Participants

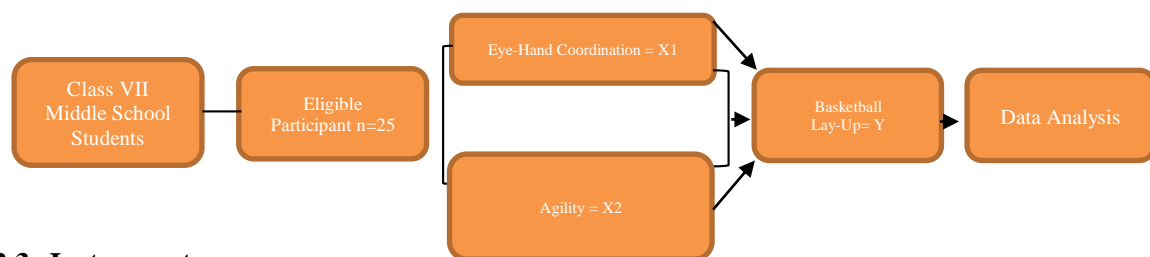
The subjects in this study were male students of class VII SMP St. Francis of Assisi Pontianak. The technique uses purposive sampling so that a sample of 25 male students is obtained.

2.2 Research Design

This research uses a quantitative descriptive approach with a correlation study method, namely research that seeks to see whether two or more variables have a relationship or not. In this study, tests and measurements were given to obtain research data on male students of class VII SMP St. Francis of Assisi Pontianak.

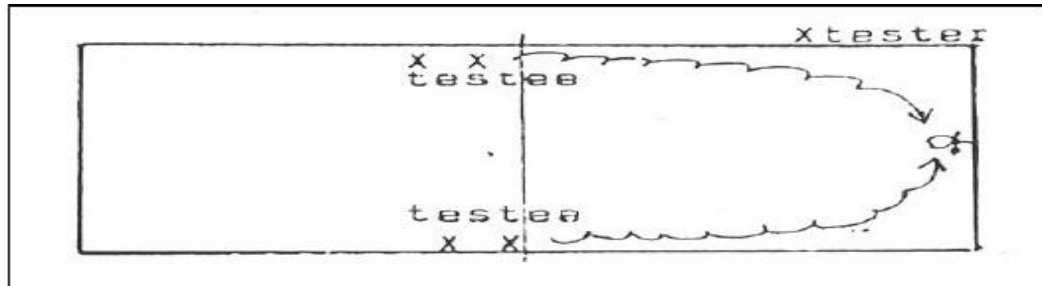
Figure 1.

Chart of Research Procedures



2.3 Instruments

The test instrument provided in this study was to obtain eye-hand coordination data with hand-eye coordination tests according to (Ismaryati, 2020). Furthermore, to find out the agility of students using the hexagonal obstacle test, and on basketball lay-up skills *using the lay - up shoot* test, namely basketball, basketball court complete with hoops, bounce boards and support poles, blank grades, stationery and whistles.

Figure 2.*lay-up* shot test

2.4 Procedures

The first stage in this study was through an eye-hand measurement test, where in this study participants were asked to throw and catch a ball in front of a wall. Next, do an agility test with a hexagonal obstacle test with 3 opportunities to get the best time. Then the participants carried out a lay-up basketball skills test with a *lay - up shoot* test , in this study the participants were asked to repeat 10 times, where the assessment of a valid shot coming in was a shot that took the right steps and the ball entered the basketball hoop.

2.5 Data Analysis

Data analysis in this study used the Pearson correlation test, this aims to determine the relationship between hand-eye coordination and agility with basketball lay-up shoot skills. Furthermore, to find out the relationship through the normality test stage, linearity test and use the correlation test which is assisted by the SPSS version 26 application.

3. RESULTS

3.1 Prerequisite Analysis Test

The prerequisite normality test was carried out to find out whether the research data was normally distributed or not. In this study, the normality test was carried out on variables using the *One-Sample Kolmogorov-Smirnov test technique* with the help of the SPSS 26 program with a significance level of 5%. The criterion is that the data is said to be normally distributed if the significance value is > 0.05 . The results can be seen in table 1.

Table 1.

Kolmogorov-Smirnov One-Sample Normality Test

Unstandardized Residuals	
N	25
Test Statistics	0.131
asyp. Sig. (2-tailed)	.200 ^{c,d}

Source: Primary Data

Based on table 1, the results show a significance value of $0.200 > 0.05$, so the data is normally distributed. Therefore, it can be continued with a correlation test to find out the relationship.

Table 2.

Test Linearity Lay-Up Skills * Eye-Hand Coordination

			ANOVA Table				
			Sum of Squares	df	MeanSquare	F	Sig.
Lay-Up Skills * Eye-Hand Coordination	Between Groups	Deviation from Linearity	1011	5	0.202	0.297	0.908

Source: Primary Data

The results of the linearity test data lay-up skills * eye-hand coordination showed a significance value of $0.908 > 0.05$, so based on these results it can be concluded that the data is linear. The results can be seen in table 2.

Table 3.

Test Linearity Lay-Up Skills * Agility

			ANOVA Table				
			Sum of Squares	df	MeanSquare	F	Sig.
Lay-Up Skills * Agility	Between Groups	Deviation from Linearity	23,891	19	1,257	0.671	0.756

Source: Primary Data

The results of the linearity test data lay-up skills * agility show a significance value of $0.756 > 0.05$, so based on these results it can be concluded that the data is linear. The results can be seen in table 3.

3.2 Correlation Test

Correlation test to find out whether the data has a relationship or not, data is said to have a relationship if the significance value is <0.05 or the $r_{\text{count value}}$ is greater than the r_{table} .

Table 4.*Bivariate Pearson Eye-Hand Coordination Correlation Test with Lay-Up Skills*

		correlations	
		Eye-Hand Coordination	Lay-Up Skills
Eye-Hand Coordination	Pearson Correlation	1	.840 **
	Sig. (2-tailed)		0.000
	N	25	25
Lay-Up Skills	Pearson Correlation	.840 **	1
	Sig. (2-tailed)	0.000	
	N	25	25

Source: Primary Data

eye-hand coordination correlation test with lay-up skills it is known that the significance value is $0.000 > 0.05$, it can be concluded that there is a significant relationship between eye-hand coordination and lay-up skills in students. The results can be seen in table 4.

Table 5.*Bivariate Pearson Agility Correlation Test with Lay-Up Skills*

		correlations	
		Agility	Lay-Up Skills
Agility	Pearson Correlation	1	-.549 **
	Sig. (2-tailed)		0.004
	N	25	25
Lay-Up Skills	Pearson Correlation	-.549 **	1
	Sig. (2-tailed)	0.004	
	N	25	25

Source: Primary Data

agility correlation test results with lay-up skills it is known that the significant value is $0.004 > 0.05$, it can be concluded that there is a significant relationship between agility and lay-up skills in students. The results can be seen in table 5.

3.2. Multiples Regression Correlation Test

Multiple correlation test to find out whether the two variables have a relationship or not, the data is said to have a relationship if the significance value is <0.05 .

Table 6.

Eye-Hand Coordination and Agility Lay-Up Skills Correlation Test*

ANOVA ^a						
Model		Sum of Squares	df	MeanSquare	F	Sig.
1	Regression	31,986	2	15,993	27.119	.000 ^b
	residual	12,974	22	0.590		
	Total	44,960	24			

Based on Table 6, it is known that *eye-hand coordination and agility* with lay-up skills shows a significance value of $0.000 < 0.05$. It can be concluded that *eye-hand coordination and agility* has a significant relationship to lay-up skills in students.

4. DISCUSSIONS

Sports skills usually require hand eye coordination. Because motion skills always consist of several elements of motion, which are then combined to form a certain motion pattern (Subekti, 2019). In addition to height and reaction speed, hand-eye coordination is also very important when playing (Illahi, 2019). Because with good hand-eye coordination, accurate shots are maximized when done correctly (Hermawan & Rachman, 2018). According to (Mahyuddin & Sudirman, 2021) Hand-eye coordination is the ability to effectively integrate various movements into one movement pattern at the same time. According to (Hanief, 2015) argues that coordination is the action of several muscles simultaneously with good timing and balance in one movement. From the above opinion it can be concluded that eye-hand coordination is the human ability to integrate eye movements in response to hand movement stimuli into certain movement patterns to produce coordinated, efficient and effective movements.

Hand eye coordination is a movement related to the implementation of its functions, meaning that timing, balance, and muscle coordination work harmoniously (Efendi, 2017). Time is the rhythm regulator of movements, expressed in terms of the exact timing of the contraction of muscle groups to achieve a faster movement and the sequence and duration of the elements of the movement to be performed (Rosmi, 2017). At the same time, balance, effective alignment of the center of gravity in the support field and language functions supported by the eye are improved (Rahayu et al., 2017). The coordination task not only coordinates several movements well, but also: (1) energy efficiency and movement efficiency, (2) avoids injuries in the game, (3) learns advanced techniques and tactics through practice faster if the trainee has good coordination, and (4) strengthens the player's mental readiness to play (Amra, 2017).

This study aims to prove the relationship between hand-eye coordination and agility with basketball lay-up skills. The results showed that there was a significant relationship between hand-eye coordination and basketball lay-up skills. Furthermore, the results of agility with basketball lay-up skills also show significant value. Then, based on the results of multiple

regression tests hand-eye coordination and agility with basketball lay-up skills there is a significant relationship. Relevant research conducted by Fahrezi, (2020) proves that hand-eye coordination and agility have a significant relationship to the lay-up skills of basketball athletes. Subsequent studies obtained results that eye-hand coordination contributes to lay-up shoot skills in basketball games (Candra, 2020). A significant relationship is also shown with hand eye coordination and wrist flexibility on the ability to shoot lay-ups (Ishak & Sahabuddin, 2018). Furthermore, agility has a significant effect on the results of shooting lay ups (Kristalistianto, 2020).

Other studies say that basketball lay-up skills have a significant relationship with height and dynamic balance (Suryadi et al., 2022) , leg power (Prabowo et al., 2019). There is a significant relationship between wrist flexibility and leg muscle explosive power with the ability to lay up shoot (Pelealu et al., 2021). The next result shows that the strength of the arm muscles has a significant relationship with the results of the basketball lay-up shoot (Rahmadani, 2017). The results of this review illustrate that many aspects are related to lay-up skills in basketball. Therefore, the acquisition of these results will provide new additions related to basketball lay-up skills.

Several studies say that lay-up skills in basketball can be improved by using a modified learning method (Tang & Badaru, 2021), division-part method (Muridang et al., 2021; Sobarna et al., 2018) , cooperative learning method (Davi Sofyan, 2020;Pridani et al., 2017), learning and kinesthetic perception (Huda, 2020), Then the latest research obtained the results that ballhandling agility exercises, obstacle courses and agility turned out to have a significant effect on the ability to lay up shoot in basketball games (Idris et al., 2023). Next, it turns out that mental imagery has a significant effect on the basic lay-up technique in basketball (Ardhiansyah, 2020) .

5. CONCLUSIONS

The results of this study have a strong foundation related to *eye-hand coordination and agility* with basketball lay-up skills, based on the statements contained in the discussion. The results showed that there was a significant relationship between *eye-hand coordination and agility* with basketball lay-up skills. The results of this study provide additional new references related to lay-up skills in basketball, so these results can be an illustration for sports teachers and practitioners in sports to see what factors are related to lay-up and can provide suitable training for improving lay-up skills. in a basketball game. Recommendations for further research can be to modify the exercise for the success of basketball lay-up skills in junior high school students and use a wider sample and population.

Acknowledgment

The author thanks you for your cooperation in completing this research . Especially to school heads, physical education teachers and students at the SMP St. Francis of Assisi Pontianak.

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