ORIGINAL ARTICLE

Eye-hand coordination with basketball dribbling skills: Does it have a relationship?

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Abstract

Background and Study Aim: Basketball is a community or group sport that requires skill, physical fitness and good speed in order to perform dribbling techniques to the maximum. However, it is possible that there are many supporting factors that affect a player's dribbling ability. This study aims to prove the relationship between eye-hand coordination and basketball dribbling ability.

Material and Methods: This research uses descriptive methods with correlational research types and quantitative approaches. The sampling technique in this study used total sampling involving all male students of grade VIII, totaling 48 students. The research instrument used was a test for measuring the eye and hand coordination using the throw-catch test and dribbling skills using a basketball. The data analysis through the prerequisite normality, linearity, and correlation tests is assisted by using the SPSS 26 application.

Results: The results of calculating the correlation of eye-hand coordination with basketball dribbling skills are 0.009 <0.05, which shows a significant relationship. The study concluded that hand-eye coordination with basketball dribbling skills in male students of class VIII SMP St. Francis of Assisi, North Pontianak had a meaningful relationship.

Conclusions: The results of this study can provide a new reference to the supporting factors for dribbling skills in basketball games. Recommendations for further research reveal the relationship between balance or reaction and basketball dribbling ability.

Keywords: eye-hand coordination, basketball dribbling, basketball, balance, reaction

Introduction

Sport has a vital role in maintaining the body condition humans need. Especially in this modern era, sports activities require various things to be done, both to increase achievement and to meet the needs of a more decent life and provide health to the body. In addition, sports can be done by all groups [1]. By doing regular exercise, we can also feel the benefits of body fitness [2], and feel less burdened in doing every job [3]. This statement is reinforced by several articles that say an increase in physical fitness by doing physical activity [4–11], and can also develop the potential that exists in a person to achieve achievements [12–14]. Therefore, the most popular physical activity in the community is playing sports, one of which is basketball.

Basketball is a community or group sport that must introduce to all circles [15]. Two groups or teams play the game of basketball with five people, each trying to put the ball into the opponent's ring or basket. It is a sport that requires endurance, technique, and tactics, and various techniques in basketball are often used, namely dribbling, passing and shooting [16]. This sport requires high athlete skill and physical fitness [17], Player speed is also very important [18], because it is dynamic, active, and has a high tempo [19]. An article says a basketball player must have good height and balance [20], for easy shooting, passing, and dribbling.

Dribbling is one of a person's efforts to carry the ball anywhere with various techniques and according to applicable regulations. The game is carried out according to the player's wishes in processing the ball. Its learning can be done and can be improved by using the inquiry learning method. [21]. It turns out that basketball dribbling skills can be improved by using rope-skipping exercises [22], zig-zag and shuttle run drills [23], learning with scientific-based circuits [24]. Other research states that circuit training is done to increase leg muscle

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strength so that basketball players don't tire easily [25]. Therefore it is necessary to maintain physical fitness by providing various kinds of energy and nutrient intakes to preserve stability in carrying out a movement [26].

The problems experienced by many trainers in conducting training camps are as in the research conducted [27] there were only three athletes who had leg muscle power abilities above average, and it knew that the physical fitness of students who took part in extra-basketball belonged to the inferior category [28]. In addition, this also happened in the research conducted [29] The dribbling ability of the basketball club athletes could be better. Other problems come by, such as the research conducted, it turned out that several schools in the *Lowokwaru* sub-district only had one school that met the requirements for carrying out extra basketball coaching [30]. So, this reinforces the lack of basketball sports coaching and the government's lack of attention to the needs needed by schools to meet the resources in their sports facilities.

Several articles state that there is a relationship between a person's ability to do a lay-up on eye-hand coordination [31,32], and the results of further research carried out by [33] that a person's skill in doing a lay-up in basketball is influenced by hand-eye coordination, based on some of the opinions above, it can be concluded that eye-hand coordination is needed in the game of basketball, the implications of dribbling basketball may be the dominant source of increasing eye-hand coordination. [34], because in dribbling, there needs to be good coordination so that it is easy for players to dribble the basketball in a match. When dribbling, you need good concentration and eye-hand coordination skills to control the reflection of a basketball dribbling. However, it is very rarely done to determine the contribution made when carrying out tests and measurements. Based on these problems, this study aims to prove the relationship between dribbling skills and eye-hand coordination in a basketball game.

Materials and Methods

Participants

The population in this study were all male students of grade VIII at St. Francis Assisi Middle School, North Pontianak. The sampling technique in this study used total sampling involving all male students totaling 48, consisting of 16 students VIII A, 15 students from VIII B and 17 students from VIII C.

Research Design

This study uses a descriptive research method with a correlational research type and a quantitative approach. The research instrument used was a test for measuring eye and hand coordination using a throw-catch test based on [35], and the ability to dribble using a basketball; the basketball court is made of 6 obstacles with a length of 12.5 m and a width of 5 m, blank marks, stationery and stopwatches [36].

Statistical Analysis

Then the data analysis through the normality prerequisite and correlation tests was assisted using the SPSS 26 application.

Results

The data obtained from the field will then be arranged in a table and calculated sequentially based on the scores in each variable. After that, the data is resolved by using statistical calculations. The average calculates the score from the raw data arranged in the table (mean), namely hand-eye coordination at 12.67 and basketball dribbling skills at 6.04. The results of statistical calculations can be seen in table 1, listed below.

Table 1. Results of Calculating the Average (mean) and Standard Deviation of The Score Data

Results	Eye-Hand Coordination (X)	Dribbling Skill (Y)
Mean	12.67	6.04
Standard Deviation	1.98	1.09

Based on the table above, the standard deviation of hand-eye coordination is 1.96, and basketball dribbling skills are 1.69. Furthermore, from the data obtained, the calculation of the normality prerequisite test is carried out.

Table 2. Shapiro-Wilk Normality Test

Normality Test	df	Sig.
Eye-Hand	48	.123
Dribbling	48	.052

Based on table 2, the normality test results obtained a significance value of 0.123 for dribbling ability and 0.052 for hand-eye coordination > 0.05. These results show that the research data is normally distributed.

Table 3. Linearity Test

Variable	Linearity	Sig.
Dribbling * Eye-Hand	Deviation from Linearity	.553

Based on table 4, the results of the data linearity test show that the dribbling ability with hand-eye coordination is 0.553 > 0.05. The results show that there is a significant linear relationship.

After performing the prerequisite test calculations like the tables listed above, the data obtained is calculated to find the correlation between hand-eye

Table 4. Eye-Hand Coordination Correlation Test and Basketball Dribbling

Variable		Eye-Hand Coordination	Basketball Dribbling
Eye-Hand Coordination	Pearson Correlation	1	.371**
	Sig. (2-tailed)		.009
	N	48	48
Basketball Dribbling	Pearson Correlation	.371**	1
	Sig. (2-tailed)	.009	
	N	48	48

coordination and basketball dribbling skills using the Bivariate Pearson correlation test.

Based on table 4 above, the correlation calculation between hand-eye coordination and basketball dribbling skills in male students of class VIII SMP St. Francis of Assisi shows a significance value of 0.009 <0.05, so there is a significant relationship.

It is known that N = 48 with a significant level of 5%, then the r table is 0.284; based on these results, r counts 0.371 > r table 0.284, which means Ho is rejected; this means that the calculation of the correlation results is acceptable, based on test data carried out in the field or in sample groups that have been selected to prove that there is a positive relationship between hand-eye coordination and basketball dribbling skills.

Discussion

This study aims to prove the relationship between the eye and hand coordination with dribbling skills in basketball games. The research results show a significance value of 0.009 <0.05 which means Ho is rejected, thus giving the meaning that the calculation of the correlation results is acceptable. Based on these results proves that there is a significant relationship between hand-eye coordination and basketball dribbling skills. There is an expression from research stating that there is a considerable relationship eye-hand coordination to dribbling skills in basketball [37, 38].

One's efforts in training that can be used to increase basketball dribbling learning can be increased by using cooperative learning methods and by using several cycles that are used to determine the progress of knowledge that has been carried out [39]. Dribbling technical skills in basketball can also be improved by using ballhandling exercises [40]. Besides that, dribbling skills in basketball can be developed by using training methods that are carried out without any rest time [41]. From the results of the three articles that have been researched, it can be concluded that a person's dribbling ability can be improved by various methods that can be given.

Supporting elements in basketball are based on several articles that state the ability of leg muscles also influences the game of basketball [42]. Similarly, movement agility is essential in the game of basketball; having skill will make it easy to move in all directions to outwit your opponent or pass your opponent. [43]. So that the need to increase one's movement agility is one way by using the Z-run exercise [44]. From the three studies above, it can be concluded that in the game of basketball, must take many things must into account in doing the exercises to get maximum results.

Based on the research results, it turns out that there is an increase in dribbling skills for beginners in basketball games using the dribble training model [45]. Therefore the ability to dribbling a basketball is also influenced by a person's balance and agility in reading the situation [46]. So that the use of dribbling exercises in a zig-zag way can provide an increase in one's motion abilities in doing dribbling [47]. In addition, there is research that uses two methods, it turns out that the use of the two training methods used greatly influences the improvement of dribbling skills in basketball [48]. Several studies have examined a person's ability to dribble is also very much needed in playing basketball.

It turns out that can improve dribbling basketball skills by using dribbling exercises with zig-zag steps [49]. In addition, the dribbling ability of children who take part in extracurricular basketball has a close relationship with speed and agility [50]. So it is very efficient to use dribbling exercises in basketball by shuttle run exercises because they already have good speed, agility and balance [51].

The need for eye-hand coordination in basketball is proven by several studies that have been conducted; it turns out that a person's skills in dribbling are influenced by hand-eye coordination. [52]. In addition, dribbling ability has a close relationship with eye-hand coordination [53]. In addition to the research conducted [54] eye-hand coordination has a significant effect on wrist flexibility in dribbling. It can be concluded from previous research that eye-hand coordination is crucial in basketball games.

In addition to influencing and relating to dribbling ability and eye-hand coordination, there is also a relationship between hand-eye coordination and throwing power to put the ball into the basket in a basketball game [55]. Other studies have found that there is no relationship between eye-hand

coordination and a person's ability to enter the ball in a basketball game [56]. There is a relationship between eye-hand coordination and the ability to throw the ball in an effort to put the ball into the hoop [57]. It turns out that free throw ability in basketball is influenced by eye-hand coordination [58]. It turns out that there is also a relationship between free throw ability and eye-hand coordination [59]. Four of the five previous studies provided a relationship or influence on the game of basketball, and one stated no relationship or impact.

Conclusions

Based on the research results above, it has a strong foundation regarding the relationship between eye and hand coordination and dribbling skills in basketball games, on the basis of references from previous studies that have been carried out, which are listed in the discussion of results and discussion. So, there is a significant relationship between hand-eye coordination and dribbling ability in basketball games. The results of this study prove that the contribution of the relationship between eye-hand coordination to dribbling ability is significant. However, it should be noted that the limitations of this study lie in the activities carried out by students outside the school environment and only conducted this research on male students as samples. The results of this study can provide a new reference about the supporting factors for dribbling ability in basketball games so that coaches and sports teachers can consider these results to pay attention to factors that contribute significantly to dribbling skills.

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Conflict of interest

There is no conflict of interest.

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