

HAND EYE COORDINATION AND EXPLOSIVE POWER OF LIMB MUSCLES FOR UNDER RING ABILITY IN PLAYING BASKETBALL

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Abstract

The problem in this study is the under ring shooting ability possessed by the extracurricular basketball participants of SMAN 2 Tebo which is still low. This study aims to see the relationship between eye-hand coordination and explosive power of leg muscles to the ability to shoot under the basketball hoop. This type of research is correlational with two free variables. the sample in this study was all participants in basketball extracurricular activities totaling 34 people. The instruments used are vertical jump, tennis ball catch throw and shooting under ring. The data in this study were analyzed using simple correlation and double correlation. The results are as follows: (1) There is a relationship of eye-hand coordination to the shooting under ring ability of basketball players with a calculated r value of $0.439 > r_{table} 0.344$, (2) There is a relationship of the explosive power of the leg muscles to the shooting ability of the under hoop of basketball players with a calculated r value of $0.402 > r_{table} 0.344$, (3) There is a relationship between eye-hand coordination and explosive power of limb muscles simultaneously to the shooting under hoop ability of basketball players with a calculated r_{value} of $0.518 > r_{table} 0.344$ and with a calculated F_{value} of $5.69 > F_{table} 3.30$.

Keywords: Eye-Hand Coordination; Explosive Power of Limb Muscles; Shooting Under Ring

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INTRODUCTION

Sports is an activity that is widely carried out by the community, its existence today is no longer underestimated but has become part of people's lives. Exercise is a physical activity carried out to get a healthy and strong body, the activity itself tends to be fun and entertaining. In accordance with the law of the republic of Indonesia No. 3 of 2005 concerning the national sports system stipulates that sports are all aspects related to sports that require regulation, education,

training, development and supervision. The national sports system is the entire aspect of sports related to systematic, integrated and sustainable planning as a unit which includes regulation, education, training, development, management and coaching as well as supervision to achieve national sports goals.

Looking at the purpose, sports are divided into three, namely educational sports, achievement sports, and recreational sports. Educational sports are carried out in schools, achievement sports are carried out in sports clubs through the main sport, while recreational sports are carried out only to fill free time. In the implementation of extracurricular activities, students are directed to choose one of the various activities held by the school based on their interests, talents or achievements. One of the sports that enters into extracurricular activities at SMA N 2 Tebo is basketball. Basketball is one of the team sports in Indonesia. Basketball consists of 5 people in a team who have their own duties and roles in the game to get a victory. Basketball is a sport that requires teams to score as many points within a certain period of time. In addition, this sport is easy to play because of the large shape of the ball, so it does not make it difficult for players when playing it (Wamena and Muhammad, 2020)

The goal of a basketball game is to put the ball into the opponent's basket with as much as possible and keep the opponent to obtain numbers. Therefore, a good shot is a shot that goes into the opponent's basket and generates numbers, not on the attraction (Riyanto and Kuswoyo, 2019). There are many basic technical skills that a basketball player must master, namely shooting skills which are an effort to put the ball in the opponent's basket or basketball hoop to earn points. Shooting is the most famous and popular basic basketball skill, because everyone has an instinct to attack and wants to put the ball in the hoop (Syafi'i, 2014).

In shooting this can be done in two ways, namely by shooting with two hands and shooting with one hand. Mastery of basic skills is one of the efforts to improve achievements towards higher ones. The level of skills possessed by the players will determine their appearance in a basketball game. Good playing skills

can be mastered by being learned or trained continuously in a certain period of time (Pratama et al., 2022). There are several factors related to the shooting under ring ability of basketball players, including eye-hand coordination, explosive power of limb muscles, concentration, agility and explosive power of the leg muscles.

Biomotor components are important elements in basketball, one of which is coordination. Coordination is a biomotor ability that is interconnected in its implementation consists of several complex physical aspects with one another, resulting in effective and efficient movements. Good eye-hand coordination can result in accurate shooting. Coordination between the eyes and hands is very necessary for an athlete, so that when playing, he can respond on target and quickly in making decisions. If a player has good coordination, it will be easy to apply shooting skills under the ring. But on the contrary, if a player has weak eye-hand coordination, it will be difficult to shoot under the ring (Marta & Otkarifaldi, 2020).

The explosive power of the limb muscles is the ability of the leg muscles to withstand the weight in carrying out an activity. Without good explosive power of the limb muscles people cannot run fast, jump on the shoulders and so on. So obviously for us the explosive power of the limb muscles is needed in most physical activities. In basketball, the explosive power of the limb muscles is the main focus that determines basketball achievement. If players want to get a jump and push of the ball with little time to achieve accurately fast and precise, it should be when shooting under the ring to pay a lot of attention to the balance of the body, which is trying to be able to jump and push the ball to the maximum. Vice versa without having good explosive power of the limb muscles will affect the distance of the jump and push results, so it takes a long time to get to the ring.

concentration is the ability to focus attention on a task that is not hindered or performed by external or internal stimuli. Concentration focuses on something and is not hindered by unrelated internal or external stimuli. Internal stimulus is the feeling of being disturbed by the body, and other emotions that are felt to interfere

with the physical and psychic state, such as being very tired, restless, and so on (Arisman et al., 2021).

In addition to eye-hand coordination, agility in basketball can also be seen when a player faces two opponents at once, it requires fast moving ability and good possession of the ball so that when the player has good agility, it will make it easier for the player to pass the opponent. In basketball, when a player moves to receive a ball that is pointing back, front or pointing to the side, then with good agility it will make it easier for players to move according to the direction the ball falls so that it can return the ball from the opponent's blow.

Agility is one of the components of motor freshness necessary for all activities that require the speed of change in the position of the body and its parts, especially in the game of basketball. Good agility is very necessary in strengthening the shooting under ring ability of a basketball player because this under hoop shooting technique is a combination technique of dribbling which is followed by entering the ball.

Psychological circumstances, one of which is motivation, also have a big role in the success of shooting under the hoop on basketball players. Motivation is the motivation that exists in a person to do something, be it an impulse that comes from within or outside the person. Although a person has good abilities, but if he does not have the motivation to perform the assigned tasks, then he will not do it to the maximum. But if a person has great motivation in him, then he will do it as much as possible in order to create victory points for his team.

METHOD

This type of research is correlational who wants to see the relationship between free variables and bound variables. (Abdullah & Susanto, 2015) correlational research is a study to determine whether there is a relationship between two variables, the magnitude of the relationship between the two variables is expressed in the form of a correlation coefficient. The free variables of this study are Hand Eye Coordination (X1) and Limb Muscle Explosive Power (X2), while

the bound variables are Under Ring Shoot (Y). This research was carried out from March 17 to March 22, 2022 by including all participants in extracurricular activities who were selected as samples.

(Sudaryono, 2018) The sample is a part of populai, it includes a number of members selected from the population. The sampling technique in this study was carried out using the Total sampling method. Total sampling is a sampling technique where the number of samples is equal to the population (Sugiyono, 2017).

RESULT

Eye-Hand Coordination

Based on the results of research obtained on the eye-hand coordination of extracurricular participants of SMA N 2 Tebo basketball as many as 34 people obtained the highest score of 12 and the lowest score of 5. Then get an average value of 8 and a standard deviation value of 2.28. For a description of the study data can be seen in the following frequency distribution table:

Table1. Frequency Distribution of Eye-Hand Coordination Data

No.	Interval Class	Absolute Frequency	Relative Frequency	Information
1	< 5	4	11,76%	Less Once
2	6 - 7	10	29,41%	Less
3	8 - 9	10	29,41%	Keep
4	10 -12	10	29,41%	Good
5	> 13	0	0,00%	Very Good
	Sum	34	100%	

Explosive Power of Limb Muscles

Based on the results of research obtained on the explosive power of leg muscles of the extracurricular participants of SMA N 2 Tebo basketball as many as 34 people obtained the highest score of 72.71 and the lowest score of 72.71. Then get an average value of 97.21 and a standard deviation value of 12.03. For a description of the study data can be seen in the following frequency distribution table:

Table2. Frequency Distribution of Limb Muscle Explosive Power Data

No.	Interval Class	Absolute Frequency	Relative Frequency	Information
1	<77.96	2	5,88%	Less Once
2	77,97 - 90,62	6	17,65%	Less
3	90,63 - 103,27	16	47,06%	Keep
4	103,28 - 115,93	8	23,53%	Good
5	>115.94	2	5,88%	Very Good
	Sum	34	100%	

Under Ring Shooting

Based on the results of research obtained regarding the under ring shooting ability of 34 high school N 2 Tebo basketball extracurricular participants, the highest score of 22 and the lowest score of 7 were obtained. Then get an average value of 13 and a standard deviation value of 4.23. For a description of the study data can be seen in the following frequency distribution table:

Table3. Under Ring Shooting Data Frequency Distribution

No.	Interval Class	Absolute Frequency	Relative Frequency	Information
1	< 6	0	0,00%	Less Once
2	7 - 11	16	47,06%	Less
3	12 - 15	10	29,41%	Keep
4	16 - 19	5	14,71%	Good
5	> 20	3	8,82%	Very Good
	Sum	34	100%	

Hypothesis 1

The first hypothesis the researchers put forward was that: "There is a link of eye-hand coordination to shooting under the ring of N 2 Tebo High School basketball extracurricular students". The results of the calculations that the researchers carried out using the product moment correlation formula showed that the calculated r value was $0.439 > r_{table} 0.344$. This means H_a is accepted and H_0 is rejected, that there is indeed a link of eye-hand coordination to shooting under rings of N 2 Tebo High School basketball extracurricular students. Then to find out

the significance of the correlation between X1 and Y, a significance test was carried out which obtained a calculated price of $2.77 > t_{table} 2.021$ which proved that the relationship between X1 and Y was significant.

Hypothesis 2

The first hypothesis the researchers put forward was that: There is a relationship of the explosive power of the limb muscles to the shooting under ring of the N 2 Tebo High School basketball extracurricular student". The results of the calculations that the researchers carried out using the product moment correlation formula showed that the calculated r value was $0.402 > r_{table} 0.344$. This means H_a was accepted and H_0 was rejected, that there was indeed a relationship of the explosive power of the hand muscles to the shooting under hoop of the N 2 Tebo High School basketball extracurricular students. Then to find out the significance of the correlation between X2 and Y, a significance test was carried out which obtained a calculated t price of $2.48 > t_{table} 2.021$ which proved that the relationship between X2 and Y was significant.

Hypothesis 3

The first hypothesis the researchers put forward was that: There is a relationship between eye-hand coordination and limb muscle explosive power to shooting under rings of N 2 Tebo High School basketball extracurricular students". The results of the calculations that the researchers carried out using the product moment correlation formula showed that the calculated r value was $0.518 > r_{table} 0.344$. This means H_a is accepted and H_0 is rejected, that there is indeed a relationship of eye-hand coordination and explosive power of limb muscles to shooting under ring students of extracurricular basketball N 2 Tebo. Then to find out the significance of the correlation between X1, X2 and Y, a significance test was carried out which obtained a calculated F price of $5.69 > F_{table} 3.30$ which proved that the relationship between X1, X2 and Y was significant.

DISCUSSION

The Relationship of Eye-Hand Coordination to Shooting Under Ring Ability

Based on the results of a study that researchers have conducted some time ago, researchers found that there is a relationship between eye-hand coordination and shooting under rings of high school basketball extracurricular students N 2 Tebo. The results of the calculations that the researchers carried out using the product moment correlation formula showed that the calculated r value was $0.439 > r_{table} 0.344$. This means H_a is accepted and H_0 is rejected, that there is indeed a link of eye-hand coordination to the shooting under ring of students participating in the extracurricular basketball of N 2 Tebo High School. It is clear that the under-hoop shooting ability possessed by the students participating in the N 2 Tebo High School basketball extracurricular is related to hand-eye coordination. In the future, in order for the shooting ability of the under ring to be improved, the variable eye coordination needs to be trained and get attention.

Basketball is a sport that uses a ball that can be passed or thrown at a friend. The ball is reflected to the floor on the spot or while walking and the goal is to put the ball into the basketball or basket of the opposing team. In basketball games, many require physical contact with other players or opposing players, so good body condition is very necessary. The skill of playing basketball will be achieved when mastering effective and efficient movement techniques. Mastering basic skills is the most important capital to get a victory in a match. (Mielke, 2007) Basic techniques in playing basketball include footwork, shooting the ball into the basket (shooting), throwing (passing), catching, dribbling, moving with the ball, moving without the ball, and defending.

In order to be able to play basketball optimally, of course, every player is required to have the physical conditions needed, one of which is spy-hand coordination. (Asriadi, 2019) coordination is the ability to unite various separate motion nervous systems into one efficient pattern of motion. The more complex the movements made, the greater the level of coordination required to carry out

dexterity. Coordination is closely related to the speed of strength, endurance, flexibility and it is also very important to learn and perfect techniques and tactics. (Pamugar, 2017) in eye-hand coordination will result in timing and accuracy. Timing is oriented towards punctuality while accuracy is oriented towards goal accuracy. Through good timing, the introduction of hands and objects will be as desired in this case the introduction of hands on the ball, so that it will produce effective movement. Accuracy will determine whether or not the object is right on the intended target in this case the accuracy of the direction and placement of the ball on the target. Therefore, hand-eye coordination is very important in the ability to perform service so that the service can be right on the desired target. Eye-hand coordination is needed by everyone in directing an object towards the goal to be achieved.

With good coordination, then an object thrown will successfully reach the target. Basically, coordination has almost the same meaning, so it can be concluded that eye and hand coordination is the ability of the eye to integrate the stimuli received and the hand as a driving function to perform movements as desired. To be able to achieve a good level of coordination, a great many factors affect it. there are determinants of coordination are: a) Regulation of the central nerve and peripheral nerves, this is based on the carrier of the athlete and bacillus from training, b) Depending on the tone and elasticity of the muscles, c) Whether or not balance and agility, d) Coordination of the work of the nerves, muscles and five senses (Ismaryati, 2006).

Relationship of Explosive power of limb muscles to Shooting Under Ring Ability

Based on the results of a study that researchers have conducted some time ago, researchers found that there is a relationship between the explosive power of limb muscles to shooting under the ring of extracurricular students of SMAN 2 Tebo basketball. The results of the calculations that the researchers carried out using the product moment correlation formula showed that the calculated r value was

0.402 > rtable 0.344. This means that H_a was accepted and H_0 was rejected, that there was indeed a relationship between the explosive power of the limb muscles to the shooting under ring of the students participating in the extracurricular basketball of N 2 Tebo High School.

The basic skill that every basketball player must have is shooting, because the purpose of the basketball game is to put the ball into the opponent's basket as much as possible and prevent the opponent from making points. The integration between the mental aspects and the mechanics of shooting is the key to educating from the success of shooting itself (Wissel, 2012). The basic shooting technique is an important basic technique, although it does not leave other basic techniques. In order for the shooting ability to be carried out properly, the explosive power factor of the leg muscles needs to be improved.

One of the elements of physical condition that has an important role in sports activities, both as a supporting element in a certain movement and the main element in the effort to achieve a perfect motion technique is explosive power. Explosive power is an element among the components of physical condition, namely human biomotor ability, which can be increased to a certain extent by doing certain appropriate exercises. Explosive power is an athlete's ability to overcome an obstacle at a high contraction speed. This explosive power must be shown by the transfer of the body (long kick) or (javelin thrown) across the air, where the muscles must expend strength at high speed, in order to be able to carry the body or object during the implementation of motion to be able to reach the distance. Power is a combination of strength and speed which is one of the aspects of physical condition that is very important in achieving optimal performance.

The Relationship of Eye-Hand Coordination and Explosive Power of Limb Muscles to Shooting Under Ring Ability

Based on the results of a study that researchers have conducted some time ago, researchers found that there is a relationship between eye-hand coordination and explosive power of leg muscles to shooting under rings of extracurricular

students of SMA N 2 Tebo basketball. The results of the calculations that the researchers carried out using the double correlation formula showed that the calculated r value was $0.518 > r_{table} 0.344$. This means H_1 is accepted and H_0 is rejected, that there is indeed a relationship between eye-hand coordination and explosive power of limb muscles to shooting under ring students participating in extracurricular basketball SMAN 2 Tebo.

Basketball is a game whose movements are complex, namely a combination of walking, running, and jumping as well as elements of strength, speed, accuracy, flexibility and others. To become a good basketball player, you must master the basic techniques of the game of basketball, because the better a player is at dribbling, shooting, and passing the better the possibility of success, this must also be supported by good physical condition. A basketball game is a game that has various elements of motion in it. A series of movements that exist in a basketball game are various basic techniques that players must master to be able to play basketball well and efficiently. According to (Syafudin, 2011) The ability of a basketball player in a match or competition is basically determined by four factors, namely "physical condition, technique, tactics and mental (psychic) factors.

However, no matter how good the player is in the dribble technique, the pass or defense of the team will not win a game. Because the skill only ushers in an opportunity to score, still players need shots to score. Therefore, shooting in basketball is a skill that must be possessed by every player, although each player has a different percentage of shoot success. There are several physical conditions needed in basketball games, including eye-hand coordination and explosive power of the limb muscles.

Coordination is the combination of the functions of several muscles precisely and balanced into one pattern of motion. (Ismaryati, 2006) coordination is a very complex biomotor capability. In other words coordination is the ability to combine several movements without tension, with the correct sequence and perform complex movements smoothly without excessive energy expenditure. Good

coordination will be able to combine several movements without tension with the correct sequence and perform complex movements smoothly without expending excessive energy. Thus the results of the movements performed are very efficient, smooth, smooth and well coordinated.

Eye-hand coordination is an element of physical condition that is indispensable in shooting under the ring in basketball. It can be interpreted as the eye as a signal catcher (stimulus) and tells the ball is in the right position, so that the hand makes a shooting movement or inserts the ball towards the basketball hoop (basket). If a basketball player has good eye and hand coordination, the movement when shooting under the hoop will be more effective and efficient. Having good eye-hand coordination will make it easier for someone to do accuracy in doing in the game of basketball.

Explosive power is a combination of maximum speed and maximum strength. This explosive power must be indicated by the displacement of the body (in a long kick) or an object (a rejected bullet) across the air, where the muscles must expend force at a high speed, in order to be able to carry the body or object at the time of the execution of motion to be able to reach a distance. (Bafirman, 2008) the explosive power of the limb muscles is very important for appearance because it can determine how hard a person can hit/kick, how far to throw, how high a person can throw, how high a person can jump and farther his jumps, how fast a person can run and swim. Coordination is the ability of a person to string several elements of motion into one harmonious movement according to his goals (Syafuruddin, 2013).

CONCLUSION

Based on research that researchers have conducted on participants of basketball extracurricular activities of SMAN 2 Tebo, there is eye-hand coordination and explosive power of limb muscles on the ability to shoot under the ring, as follows 1). There is a relationship between eye-hand coordination and shooting under ring ability with a calculated r value of $0.439 > r_{table} 0.344$ with a

significance test value of $t_{count} 2.77 > t_{table} 2.021$ 2). There is a relationship between the explosive power of the limb muscles to the shooting under ring ability with a calculated r value of $0.402 > r_{table} 0.344$ with a significance test value $t_{count} 2.48 > t_{table} 2.021$. 3). There is a relationship of eye-hand coordination and explosive power of the limb muscles to the ability of shooting under the ring with a calculated r value of $0.518 > r_{table} 0.344$ and $F_{count} 5.69 > F_{table} 3.30$

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