

## The effect of arm length, arm endurance and self-confidence on petanque shooting

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### Abstract:

This research is motivated by the large number of petanque players who are interested in getting achievements, while to get good petanque athletes it is necessary to know how big the relationship between arm muscle endurance and anatomical arm length and confidence in shooting results. The purpose of this study was to determine the anatomical relationship between arm length, arm endurance, and self-confidence to the results of shooting throw in petanque. Path analysis design research method. Purposive sampling technique, the sample was 16 petanque athletes. Path analysis at significance level = 0.05. While the requirements to apply data path analysis must be analyzed using normality and linearity tests. The findings in this study explain that the five research hypotheses are accepted. The results of this study explain that the five research hypotheses are accepted (H1) arm length has a direct effect on the result of shooting throw in petanque (H2) arm muscle endurance has a direct effect on shooting throw results in petanque (H3) Self-confidence has a direct effect on shooting throw results in petanque (H4) Arm length and arm muscle endurance has a direct effect on self-confidence (H5) . Based on the results of this study, it can be concluded that arm length, arm muscle endurance and athlete's confidence have a direct effect on the results of shooting throw in petanque.

**Key Words:** Arm Length, Arm Endurance, Confidence, Shooting Throw, Petanque

### Introduction

Petanque is a traditional sport from France. It has been developed into an achievement sport, this sport is standardized and regulated by the establishment of the parent organization, namely the Federation Internationale de Petanque et Jeu Provençal (FIPJP). Found in Marseille, France in 1958. In Indonesia this sport has existed since the 1990s, especially in French-owned hotels to be used as hotel support facilities. However, petanque has developed and is known to the public since 2011 when Indonesia hosted the 26th SEA GAMES in Jakarta – Palembang. Petanque has 2 types of throw that determine the game namely pointing and shooting (Pelana, Irfansyah, & Setiakarnawijaya, 2019). The pointing technique is a throw that aims to bring the boules closer to the jack. B. W. Puttman (2011) “In performing the correct pointing skill, the bosi is held with the entire palm of the hand and clenched into a fist without any space on the knuckles. So that the throw results can be perfect and reach the target” The shooting technique is a throw that aims to keep the rival’s boules away from the jack. This is of course only done if the opponent’s boule plays a position closer to the wooden ball than the team’s own boule. To play petanque is actually not difficult, because players only need to throw their ball to stop near the jack. Samsudin (2017) reveal Petanque is a sport that requires manipulative skills (throwing) and visual object control where athletes must throw boules to land close to the jack to get points In shooting according to Pelana, (2016) there are components that affect shooting, there was ball grip, body position towards the target, static leg balance, low body position and leaning forward, *release the ball, follow through*.

In this sport, posture also affects the results of the throws, such as body height and arm length can affect the results of the height and angle of the throw. According Hermawan (2012) throwing technique in petanque sports generally applies power to the throw and the angle of the throw is the key to reach a certain horizontal length.

1. Petanque sports are included in achievement sports. There are 4 components as an important role in the achievement of petanque achievements (Pelana, 2016):
2. Biological aspects, including the basic abilities of the body, organ function, posture, and nutrition.
3. Psychological aspects, including coordination of movement, intellectual, motivation, and personality, .
4. Environmental aspects, including social, facilities and infrastructure, and weather.
5. Supporting aspects, including coaches, training programs, and awards.

This is supported by research from (Pilus, Amin, Din, & Muhammad, 2017) that the steady lob exercise program in petanque sports showed better and more significant skill performance compared to the normal

significant skill performance compared to the normal learning group. While the research conducted by Maimun Nusufi (2015) found a significant contribution between arm and muscle endurance and accuracy in archery's athlete. In 2015 Achery federation in Aceh, Indonesia shows a correlation coefficient of 0.897 or 80.46%, meaning that the endurance of the arm muscle plays an important role in archery accuracy.

Therefore, for petanque athletes there are several factors that must be considered to support the success of an athlete. One of them is in making the throw, these factor in general as follows: throwing technique, arm endurance, mental, accuracy of decision, making on the technique used. With physical strength and endurance, a person will be more confident in throwing his boules so that it will produce an accurate throw. According to Charles LD (2018) Muscular endurance is defined as the ability of a muscle group to execute repeated contractions over a period of time sufficient to cause muscular fatigue, or to maintain a specific percentage of maximum voluntary contraction for a prolonged period of time. Supported by Tatang Isknadar research (2018) which states that Based on the results of the study it can be concluded that Dumbbell Swing exercises have a significant effect on the strength of the athletes' arm muscle of Petanque sport training in Bekasi with the results of  $t$  count = 11.58 at alpha 5% or ( $\alpha$ ) = 0.05 (Isknadar, Faiz Ridlo, & Dwi Oktaviana, 2019).

From the problems that have been previously described, for those who are still lacking in physical terms, they need to do special physical training, but the level of every person physical and anatomical condition is clearly different. Meanwhile, to get a good petanque athlete, it is necessary to know how much the relationship between the endurance of the arm muscle and the anatomical length of the arm and the confidence in the result of the shooting.

As stated above, it shows that it is necessary to conduct research on the effect of arm length, arm endurance and confidence on shooting petanque, which later can be taken into consideration in providing a petanque shooting training program as a solution to facilitate athletes in shooting petanque training more effectively.

### **Petanque**

Petanque is a sport to throwing a boules made from kind of steel and play the boules towards the target or make opponent's ball far from the target, called as shooting technique, the feet is raised and stepped on the circle. Frederic Nachim (Tri, Moch, & Ramdan, 2018). Meanwhile, according to Confederation Mondiale Sport Boules (2015), Petanque is a form of boules where the goal is to throw the metal balls as close as possible to a small wooden ball called jack and both of feet must be inside the circle. There is a special competition for shooting techniques. Begitu juga, Pelana et al., (2019) Petanque is a sport that falls into the category of boules sports, to throw the metal balls as close as the wooden ball called jack or boka and the player's feet must be inside the small circle. This game usually played on clay or rocky soil, it is not recommended to use grass or concrete areas. (Isknadar, Faiz Ridlo, & Dwi Oktaviana, 2019)

This petanque sport is included in the types of small ball sports that are precision, accuracy and strategy. This is supported Souef (2015), which states that the character of the petanque sport tends to need accuracy, no matter what age, position, gender, is allowed to play this sport. However, according Iwan Hermawan (2012), based on the main mechanical objectives, the game petanque is included in a sport that has the goal of achieving maximum accuracy. This means that basically the throw must be stopped or hit the target that has been the target of the throw, so that the result of the throw gets the winning point.

In petanque sports, there are various number matches, including: shooting men, shooting women, single men, single women, double men, double women, double mix, triple men, triple women, triple mix. For the number of matches shooting is carried out at a distance of 650 centimeters, 750 centimeters, 850 centimeters, and 950 centimeters with points that can be obtained at 0 points, 1 point, 3 points, and 5 points for each successful shooting. Shooters are only given one shot at each given disciplinary distance.

The special characteristics of petanque sports are seen in the anthropometric factors (structure, proportion, and composition) of the body, the physical factors of the physiological and biomotor parts that produce when the throw is made. based on the main mechanical objectives of the petanque game, it is included in a sport that has the goal of achieving maximum balance and accuracy ( Hermawan, 2012). From the study of sports biomechanics is "achieving maximum accuracy". The meaning is how the athlete can place the ball according to the predetermined target, by throwing both pointing and shooting techniques. (Gracia Sinaga & ., 2019).

In achievement coaching there are 4 pillars, namely mental (concentration, confidence, motivation, and anxiety), physical (physiological, biomotor, anthropometric), technique (shooting and pointing skills), and tactics (intelligence games when competing), this is the training pyramid. (Tudor O. Bompa, PhD & G. Gregory Haff, 2009). Fannin, (2005) suggested that concentration focuses to all energy to the target, so to produce the right shooting required high concentration. A person's physical appearance is also influenced by psychological factors. Physical development, psychological well-being and health when influencing a person in carrying out any sports activities. Skill factors include: movement coordination, reaction time, and so on. Like William H. Edwards (2010) defines skill is a measure of the success of the quality of movement and produces the correct constant motion to achieve certain goals (Edwards, 2010). Meanwhile, John Honeybourne (2006) Skills are used to describe the motor movements of a person who has achieved excellence in his activities. An athlete who is

considered skilled often has the qualities of coordination, ability, control, and efficiency of movement (Honeybourne, 2006). Physical factors in terms of anthropometry (weight, height, leg length, ability to move and others). Psychological and behavioral factors include (achievement motive, intelligence, self-actualization, independence, aggressiveness, emotion, self-confidence, motivation, enthusiasm, sense of responsibility, social sense, desire to win and so on.

### **Shooting Throw**

Good skills can only be acquired through a good training process. Training activities are carried out continuously and through a systematic process and are carried out continuously so that the objectives of the training can be achieved. According to Tudor O. Bompá, PhD & G. Gregory Haff, (2009) that training is the process by which an athlete is prepared for the highest performance. Meanwhile, according to Djide in Dwiyo (2008) states that training is a work process that is carried out continuously and systematically which is carried out repeatedly with an increasing number of training loads / loads. training is a systematic process of practicing that is done repeatedly with the increasing number of training loads increasing the intensity of the training." From the existing opinion, it can be concluded that training is a systematic process of sports activities carried out repeatedly with the aim of improving physical condition and skills.

The purpose of training is explained by Johansyah (2013) that "the main purpose of training is to improve athlete performance." In essence, training is a learning process for perfecting movement skills that leads to a person's ability which aims to improve physical and psychological abilities. Like Judith E. Rink (2010) says "Learning movement skills, has different characteristics from cognitive and affective learning. Singer citing Fitts and Posner's opinion that there are three stages that must be carried out by someone learning movement skills, i.e.: (1) the cognitive stage, (2) the associative stage, and (3) the automation stage." (Rink, 2010).

The training process in sports must be planned in the form of an appropriate training program, especially in terms of planning between multilateral and specialization, as well as petanque sports. This is explained by Tudor O. Bompá, PhD & G. Gregory Haff, (2009) that "the development of the athlete's overall capacity contains training in a balanced way between multilateral and specialization."

Shooting is a throw technique in petanque that is made the aim of moving the target ball away or removing the target ball from the position before shooting. Shooting technique is done when the opponent's boules is closer to the boka (in the game). Essentially the difficulty level of shooting techniques is also influenced by body position. The position of the feet must be stable at the time of hitting the ball, so that all members of the body have a good balance (Franch, 2013 dalam Trisna, 2018). However, according to Amber Vic, (2013) the shooting movement is not just just throwing the ball, but also includes directing and trying to get the ball to fall on target. practice directing the ball so that it hits the target repeatedly. Shooting is one of the most important techniques in the game and requires frequent practice by practicing shooting from various directions and distances. Shooting is hit the ball to the target. Pelana, (2016) explains that shooting is a type of throw to drive the opponent's boules from the jack.

### **Types of Shooting in Petanque**

There are 3 types : Shot on the iron, Short Shot, and Ground Shot.

Shot on The Iron is shoot right at the opponent's bosi without touching the ground first. Michel (2000) explained that "*La boule tombe sur la cible ou légèrement devant* (The ball falls on the target or is slightly ahead)". This kind of shot is a right type used on a field where conditions are uneven, requiring players to immediately shoot the boules. Boules that is thrown by the player may not land on the ground but falls directly on the target. The perfect shooting named *carreau*.

Short Shot is shoot the opponent's boules by first touching the ground about 20-30 cm from the opponent's boules. According to Michel (2000) "*L'impact au sol est plus près de la boule et sa course relativement courte. La force est moyenne* (The impact on the ground is closer to the ball and the trip is relatively short. The strength is average)". To perform this technique, the player must ensure that the field or ground around the target is not obstructed / not gravelly so that it will not stop the pace of the player's throwing ball which is directed at the target.

Ground Shot is shoot the opponent's boules by first touching the ground about 3-4 meters and rolling on the opponent's boules. According to Michael (2000) "*L'impact au sol est près du joueur et la course de la boule est longue et violente.* (Impact on the ground close to the player and run a long and violent ball)". This type of technique can only be performed on the type of field that is smooth / there is no obstacle whatsoever.

### **Arm Leg**

Long arms can affect the range. According to the anatomy team of FIK UNY (2003), the length of the arm is the part of the body along the upper and lower arms measured from the acromial point to the styloid point. The styloid point is the end of the styloideus radii process. So the description above can be concluded that the length of the arm is the arm measured from the acromion to the tip of the middle finger measured in an anatomical position. Based on the description, the length of the arm referred to in this study is the presence of the

length of the arm measured from the tip of the finger to the base of the shoulder. Arm length is one of the factors that must be considered in sports, especially petanque, because arm length will allow maximum achievement.

The arm, which functions as the driving force of the upper body (upperbody), also functions as the initial propulsion when making a quick and explosive shot. In petanque sports, the intended target is in front of the player, so that people who have long arms will have several advantages, among others, namely: the distance from the ball to the target is closer than the person with the short arm, if the other elements are the same as technique, physical, and mental, then people who have relatively longer arms in petanque will have better performance.

As human growing, bone length increases and is followed by muscle lengthening and enlarging. The length of the arm is related to reach in throwing a petanque ball, the longer one's arm, the farther the reach will be so that it is possible to get the ball closer to the target.

### **Arm Muscle Endurance**

Endurance can be defined as a state or condition of the body that is able to work for quite a long time. This is as stated by Neiman in Justinus Lhaksana (2011) that "endurance (endurance) is the ability of a person to work for a long time because there is a guarantee of muscle work, namely by taking oxygen and channeling it to active muscles. Meanwhile, according to Ozolin (1971) in Justinus Lhaksana (2011), "Endurance is a person's ability to perform activities that involve a group of muscles and systems in the body for a relatively long time". From this understanding, we can conclude that endurance is a person's ability to carry out an activity or motion task in a long time span or repetition of motion without feeling significantly tired. Hermawan (2002) "Muscles themselves are muscle cells that are long and slender in shape, each has muscle fibers and some of these muscles are collected into an organ of the body." Muscle endurance according to Widiastuti (2017) is "The muscle capacity contracts continuously at the level of submaximal intensity." Regarding muscle endurance, Silvia Sedano (2013) Muscular endurance is defined as the ability of a muscle group to execute repeated contractions over a period

So the techniques for developing muscle endurance are very similar to those used to increase strength. Arm muscle endurance is very much needed in petanque sports, because with the ability of the arm muscles to be able to do throwing techniques, especially in this case the player is able to throw a greater number of shooting throws and of course right on target.

Thus it can be seen that arm muscle endurance training is specific as needed. In line with this, Muscle endurance is endurance that shows the ability of a muscle or a group of arm muscles, in carrying out its duties for a long time. Meanwhile Muscle endurance is the ability of muscles to contract consecutively for a long time. adds that: "Muscle endurance is termed Strength Endurance is the ability of all body organisms to overcome fatigue when doing activities that require Strength for a long time. So we can conclude that muscle endurance is the ability of a muscle group to contract continuously or repeatedly.

To do an endurance test is to know the total movement that can be done or the duration of the test is used as a measure of the ability of muscle endurance. One of the measurements of muscle endurance that can be done is push-ups. This is as explained by Andi (2013) that there are two types of endurance tests, namely :

1. General endurance (Cardio Respiration) is a person's ability to do a job for a relatively long time, with sub-maximum loads, with consistent exercise intensity, for example : run 12 minutes, run 2.4 km, ergo cycle, tread mill.
2. Lokal endurance (Muscle) is the ability of a muscle to maintain its activity, static or dynamic for a long time, for example; sit up, push up, squat jumps.

### **Self Confidence**

The confidence of an athlete can be seen since the player is warming up before competing where the player who is still less confident he will repeat the attempted throw many times and until several times after throwing he will look at the coach.

Self-confidence is a belief in one's own abilities so that they are not influenced by the will of others and act accordingly, responsibly, optimistically, enthusiastically. Confidence in one's own abilities, so that you are free to do things with responsibility and without anxiety in interacting with others, knowing your weaknesses and strengths, and always trying to excel. The formation of self-confidence is a process of learning how a person responds to various stimuli from outside himself through interaction with his environment. With enough confidence, a player will be able to perform with his potential confidently and steadily.

Confidence is one of the important requirements for individuals to develop their activities and creativity as an effort to achieve achievement. Confidence does not grow by itself. Self-confidence grows from a healthy interaction process that takes place continuously.

### **Methods**

Data analysis with path analysis. Path analysis technique can be used to examine the direct and indirect effects on factors of arm length, arm muscle endurance and confidence in the shooting throw in petanque.

This study involved three independent variables, namely arm length (X1), arm muscle endurance (X2), and self-confidence (X3), as well as one dependent variable, namely the result of a petanque shooting throw (Y). In order to avoid over-interpreting this research, the variables in this study will be explained in detail.

Petanque shooting throw is a throw that directs the ball right at the target shooting target. This type of throw is commonly used in games to drive away the opponent's ball or in shooting games to hit targets with a perfect score. The test instrument for the results of this Petanque shooting throw uses the shooting test.

Arm length is an anatomical distance of the arm that is measured from the tip of the finger to the base of the shoulder. The arm length test instrument in this study was the arm length anthropometer test.

The arm muscle endurance activity referred to is the ability of a player to throw a shot for a long time and a lot of repetitions. The test instrument used was the Flexed-Arm Hang Test.

Confidence is a feeling or belief in one's own ability to be able to achieve targets, desires, and goals so that they can be resolved as well as possible despite facing various challenges and problems and carried out with a full sense of responsibility. The test instrument used was a questionnaire test instrument.

## Results and Discussion

The data used descriptive statistical methods, namely the number of samples, maximum value, minimum value, range, average, standard deviation and variance. Statistical calculation results:

**Tabel 1.** Statistical Data Research Results

		Statistics			
		X1	X2	X3	Y
N	Valid	16	16	16	16
	Missing	0	0	0	0
Mean		72.19	32.20	168.69	14.19
Std. Error of Mean		1.123	2.862	2.857	.988
Median		73.00	35.76	169.50	13.50
Mode		69 <sup>a</sup>	23 <sup>a</sup>	170 <sup>a</sup>	11
Std. Deviation		4.490	11.448	11.429	3.953
Variance		20.162	131.048	130.629	15.629
Range		15	35	41	15
Minimum		65	14	151	8
Maximum		80	49	192	23
Sum		1155	515	2699	227

Table. 1 Multiple modes exist. The smallest value is show  
**Table 2.** Hipotesis Hipotesis Sub Struktural I Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	38.436	30.261		1.270	.226
	X1	1.669	.438	.656	3.805	.002
	X2	.528	.226	.529	2.333	.035

Table. 2 Dependent Variable: X3

First, the above equation can be declared feasible to use because the significance value is  $0.000 < \alpha = 0.05$ . The coefficient table of Sub Structure Model 1 above shows that the structural equation coefficient for the arm length and confidence variables is obtained by the value of  $t_{count} = 3.805 > t_{table} = 2.115$  at level = 0.05 which means there is a linear relationship between arm length and self-confidence so that  $H_0$  is rejected,  $H_1$  accepted, the path coefficient is significant and can be interpreted that arm length (X1) has a direct effect on self-confidence (X3). The path coefficient of the effect of arm length (X1) on self-confidence (X3) is 0.656. Arm muscle endurance and self-confidence are obtained by the value of  $t_{count} = 2,333 > t_{table} = 2.115$  at level = 0.05, which means that there is a linear relationship between arm length and self-confidence. Second, the coefficient of the structural equation obtained by the arm muscle endurance variable on self-confidence is 0.529. The results of calculations for testing this hypothesis obtained a path coefficient value of 0.226 with  $t_{count} = 2,333 > t_{table} = 2.115$  at level = 0.05 so that  $H_0$  is rejected,  $H_1$  is accepted, the path coefficient is significant and it can be interpreted that arm muscle endurance (X2) has an effect directly on self-confidence (X3).

**Table 3.** Hypothesis Test Results Sub Structural Hypothesis Testing.

Model	Coefficients <sup>a</sup>			
	Unstandardized Coefficients		Standardized Coefficients	
	B	Std. Error	Beta	t Sig.
1 (Constant)	-31.303	10.551		-2.967 .012
X1	.666	.154	.757	4.328 .001
X2	.210	.073	.609	2.869 .012
X3	.250	.064	.723	3.914 .002

a. Dependent Variable: Y

It was concluded that the length of the arm and the result of the shooting at the petanque obtained a value of  $t = 4.328 > t_{table} = 2.115$  at level  $= 0.05$  So that  $H_0$  is rejected,  $H_1$  is accepted, the path coefficient is significant and it can be interpreted that the length of the arm (X1) has a direct effect on the results of the shooting (X1). Y). This means that there is a linear relationship between the length of the arm and the result of the shot. The path coefficient of the influence of arm length (X1) on the result of a shooting throw (Y) is 0.757. Furthermore, arm muscle endurance and shooting results obtained  $t_{count} = 2.869 > t_{table} = 2.115$  at level  $= 0.05$  so that  $H_0$  is rejected,  $H_1$  is accepted, the path coefficient is significant and it can be interpreted that arm muscle endurance (X2) has a direct effect on the results. throw shot (Y). There is a linear relationship between the length of the arm and the result of the shot. The path coefficient of the effect of arm muscle endurance (X2) on the result of a shooting throw (Y) = 0.609. Confidence and shooting results in petanque sports obtained a value of  $t = 3.914 > t_{table} = 2.115$  at level  $= 0.05$  so that  $H_0$  is rejected,  $H_1$  is accepted, the path coefficient is significant and it can be interpreted that self-confidence (X3) has a direct effect on the results of shooting (Y). There is a linear relationship between self-confidence and shooting results. The magnitude of the path coefficient of the influence of self-confidence (X3) on the results of shooting throws (Y) is 0.723.

**There is a direct effect of arm length on the results of a shooting throw in Petanque sports**

A player must have a good shooting technique so that the throwing results are good, and this technique is also influenced by how the player's position is standing, how his attitude is when making the throw and so on.

This means that the shooting movement is not just as long as throwing the ball towards the target but at the angle at which the ball is released. This is what makes a player's arm length affect the result of the throw, because when the throwing motion occurs the range between the ball's point of release and the target point of the ball will be closer so that the percentage of hitting the target will be high.

**There is a direct effect of arm muscle endurance on the results of a shooting throw in Petanque sports**

Throw shooting is a throwing ability with the aim of hitting a target or target. In this case, the throw that an athlete makes is aimed at driving away the opponent's ball that is close to the target or hits the target like in a petanque shooting game.

A good shot results in a shot that hits rather than the target. And having a good throwing result is a throw that can be consistent in every throw, almost never failing to hit the target. This means that to be able to say a good throw, the arm muscles must have good endurance so that each throw will get good results.

**There is a direct effect of confidence on the results of a shooting throw in Petanque sports**

The shooting throw is a throw with the aim of shooting the ball that is the target or removing the opponent's ball which is close to the jack in the game. Shooting is an important thing in a game, because if the shooting is successful, it will attract attention to the people around it, be it playing friends, opposing players, and the audience.

Shooting games often get more attention from the audience. This means that a situation that can attract the attention of people around it will bet the confidence of the player who will make the next throw. It is by virtue of that right that confidence greatly influences the outcome of the shot. And from this study we can conclude that self-confidence greatly affects the outcome of the shooting throw.

**There is a direct effect of arm length on self-confidence in petanque sports**

Arm length is a measure of the distance from the tip of the shoulder to the fingertips of the human arm. The length of the human arm is different for everyone, so there is an anthropometry to measure the length of the human arm. Having a longer arm length is better for some activities, especially for sports activities where the arm is used and there is a distance that must be achieved.

Confidence is an aspect that is so important for some people to do a job, especially for an athlete who is faced with a target. If a person has good self-confidence, then that person will be able to develop his / her potential well. With the confidence ability of an athlete, he can also achieve the target of his motion task well. Therefore, the length of a player's arm will affect self-confidence. That is because when an athlete can reach the expected distance to shorten the range, automatically the athlete's confidence increases because of his ability to

reach the target.

### **There is a direct effect of arm muscle endurance on self-confidence in petanque sports**

Arm muscle endurance is the muscle's ability to carry out its motion tasks for a long time. This makes the task of moving the arm muscles less tired and causes the inability to carry out the task of the motion. For self-confidence is a sense of his ability to complete a task and get good results.

Having self-confidence in carrying out tasks will be very helpful for work results. So it can be concluded that the endurance of the arm muscles affects the player's confidence when he is going to make the umpteenth throw. This means that the higher the endurance of the player's arm muscles, the player's confidence will not be affected because the endurance is good.

### **Conclusion**

Drawing conclusions based on the findings of the study with the independent variables of arm length (X1), arm muscle endurance (X2), self-confidence (X3) and the dependent variable consisting of shooting throws in petanque sports (Y). Then the following conclusions can be drawn: There is a direct influence between arm length (X1) on the results of the shooting throw (Y) in petanque sports. There is a direct influence between the endurance of the arm muscles (X2) on the results of the shooting throw (Y) in petanque sports. There is a direct effect of self-confidence (X3) on the results of shootinggthrows (Y) in petanque sports. There is a direct influence between arm length (X1) on self-confidence (X3) in petanque sports. There is a direct influence between arm muscle endurance (X2) on self-confidence (X3) in petanque sports. The conclusion of this studies that there is a direct effect of arm length, arm endurance, and confidence on shooting petanque.

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