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Analysis of pointing accuracy on petanque standing position: Performance and accuracy

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ABSTRACT

In developing the game of pétanque, it is necessary to master good basic techniques because this is the initial capital of an athlete to develop his game. Good mastery of basic techniques can also improve performance optimally. The purpose of this study was to analyze the accuracy of petanque pointing in a standing position at Atlas City Petanque Club (ACPC) athletes in Semarang City. The type of this study is descriptive-quantitative. The sample of this study was 8 athletes of ACPC club in Semarang city consisting one female and seven male athletes. Inclusion criteria in this study was having experience at national or international levels competitions and having trained for at least 6 months. All sample also sign the inform consent as a agreement to participate the research until the end. The results of this study indicate that the analysis of the pointing accuracy in standing position by ACPC club athletes in Semarang City is in the Precise Category, with an average distance of the ball to a target was 0.14 meters. Pointing in a standing position is very effective for a distance of 9 meters due to the ideal body position with a long throw distance from the target. The limitation of this study only focuses on the throwing distance produced by each athlete, so it has not been able to analyze every value generated from each athlete's throws. Further, research can analyze the backspin technique of pointing in a standing position to complement the current research data.

Keywords: Pointing analysis; standing position; performance; accuracy

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INTRODUCTION

Petanque is a brand-new sport in Central Java, and the region formally began managing petanque activities in January 2016 (Suwanto et al., 2018). Athletes in the sport of petanque must throw the ball so that it stops close to the target to score points. This demands manipulation skills (throwing) and control of visual objects. Only when the opponent's ball is close to the jack rather than the team's ball is this done (Samsudin & Low, 2018). Iron balls between 650 and 800 grams in weight and with a minimum diameter of 7.05 cm and a maximum diameter of 8 cm are used to play pétanque. It doesn't involve particularly strenuous efforts in those areas compared to other strength or endurance sports, but on its own, it demands a lot of fitness to generate precise pointing (Açıkada et al., 2019). Petanque is a game that may be played by people of all ages, including both of women and men, and it is becoming increasingly popular (Eler & Eler, 2018). There are two crucial fundamental skills: pointing and shooting (Pilus et al., 2017; Pelana et al., 2019). Pointing is used to bring the ball closer to the target, while shooting is used to keep the opponent's ball away or throw the target ball that can no longer be brought closer to our ball. One of the methods that every pétanque player needs to acquire is the pointing technique. It is possible to use this method while standing or while crouching (Ghassani & Irawan, 2022a). The pointing technique in a standing position is usually performed by novice athletes and is used at long throwing distances such as 8 m, 9 m, and 10 m. In doing the correct pointing, pétanque ball is held with the entire palm and clenched into a fist without any space in the fingers. So that the result of the throw can be perfect and reach the target (Putman, 2011). In pointing, concentration is needed to be able to throw and hit the target successfully. Irawan et al. (2019a) stated that by having a high concentration it takes a high concentration to be able to get the ball closer to the target. The same thing was conveyed by Hanief and Purnomo (2019) that the nine variables analyzed there were six indicator variables that showed as dominant physical factors determining petanque achievement, including height, arm length, arm muscle strength, wrist flexion, balance and eye-hand coordination. To get accurate toss results, these physical factors must be the main emphasis of every coach when dealing with athletes.

This sport is played in several events, such as singles (women, men), doubles (women, men), shooting (women, men), mixed doubles, triples (women, men), and mixed doubles (two women and one son, or two sons and one daughter). In developing the game of pétanque, it is necessary to master good basic techniques because this is the initial capital of an athlete to develop his game (Sutrisna et al., 2018). Good mastery of basic techniques can also improve performance optimally (Laksana et al., 2017). Therefore, athletes must master the basic technique well and correctly, and for a good pointing throw, if the bosi is close to the target, this can be influenced by good mastery of the basic technique. Meanwhile, Parlindungan et al. (2020) claim that the fundamental movement in petanque sports is to concentrate on the throw that each player must perfect throughout practice or competition. The angle of the backswing, swing, release, and height of the ball are some of the factors that influence the outcomes of throwing the ball in pétanque sports. The four indicators are linked and have an impact on one another (Cahyono & Nurkholis, 2018).

Previous researchers have studied the analysis of petanque sports. Such as the analysis of pointing motion in petanque (Bustomi et al., 2020), the analysis of back swing and release accuracy of pointing half lob squats in petanque (Kharim & Nurkholis, 2018), the analysis of the pointing motion of the squat position in terms of biomechanical aspects (Paulina & Irawan, 2022). Although Ghassani and Irawan (2022b) have studied it at a throwing distance of 9 meters. However, this study only focused on kinematic data and no other researchers have analyzed pointing accuracy in a standing position. This effort is expected to provide direction for further research on how to throw the pointing with the correct standing position to increase the accuracy of the shot closer to the target.

From the results of the observations, it is found that the result of the pointing in the standing position at a distance of 9 m carried out by ACPC athletes is not appropriate. The result of the throw more often did not come close to the target, and some throws were out of the target and off the court. Therefore, the purpose of this study was to analyze the accuracy of pointing throwing with a standing position of 9 m distance at ACPC Club athletes in Semarang City. In the presence of a sports performance meter, the coach will be able to identify, explain, and correct errors in the execution of movements, adjust techniques by improving motor control and become more effective both from the training process and in motivational support (Rucco et al.,

2020). It is hoped that this research will contribute to improving the accuracy of pointing throws in standing positions to create the right throws.

METHOD

This type of this study is descriptive-quantitative with the approach used accuration test of pointing in a standing position, which is assessed using an accuration instrument by Sutrisna et al. (2018). The accuracy of pointing in a standing position is assessed using an instrument of assessment which refers to the technical guidelines for the selection of the pre-PON team for the pétanque sport of Central Java Province in Al Kahfi (2021) research, which is strengthened with the validation by an expert with the initials BK as a licensed regional trainer and DFWP, who is an academic expert as a provincial administrator in pétanque. This study used 8 samples, which is consist of 1 female athlete and 7 male athletes. The criteria of being a member of the ACPC club in Semarang city with an experienced at national or international levels, and have practiced for at least 6 months. The study was conducted in the UNNES pétanque field. All samples have agreed to be participant and agreed the research procedure by signing an informed consent until the end of this study. This research has passed ethical clearance (EC) with number 372/KEPK/EC/2021 by Universitas Negeri Semarang, Ethical Research Committee. This assessment of the accuracy of the throwing only focused on a distance of 9 meters. The data obtained will be analyzed by the assessment team. The data analysis technique is that each athlete performs movements on three occasions. The best data is then selected for assessment and analysis using the pointing accuracy assessment instrument. The data analysis technique uses Kinovea 0.9.4 for video motion analysis, followed by calculating the data using Excel to find the average and standard deviation of the data.

RESULTS AND DISCUSSION

The results of this research used 8 samples of ACPC Club Athletes in Semarang City, where the profile of each athlete can be seen in Table 1.

Table 1. ACPC Athletes Profile

n = 8	Mean ± SD	Min	Max
Age (year)	20,25 ± 4,527	14	26
Height (cm)	167,5 ± 9,516	153	179
Weight (kg)	56,87 ± 16,599	38	84
BMI (kg/m^2)	19,95 ± 3,974	13,95	26,21
Arm Length (cm)	73,93 ± 4,678	68	81
Limb Length (cm)	94,37 ± 6,186	83	101

The results of the study analyzed the accuracy of the pointing throw in the standing position of ACPC athletes at a distance of 9 m, which can be seen in Table 2.

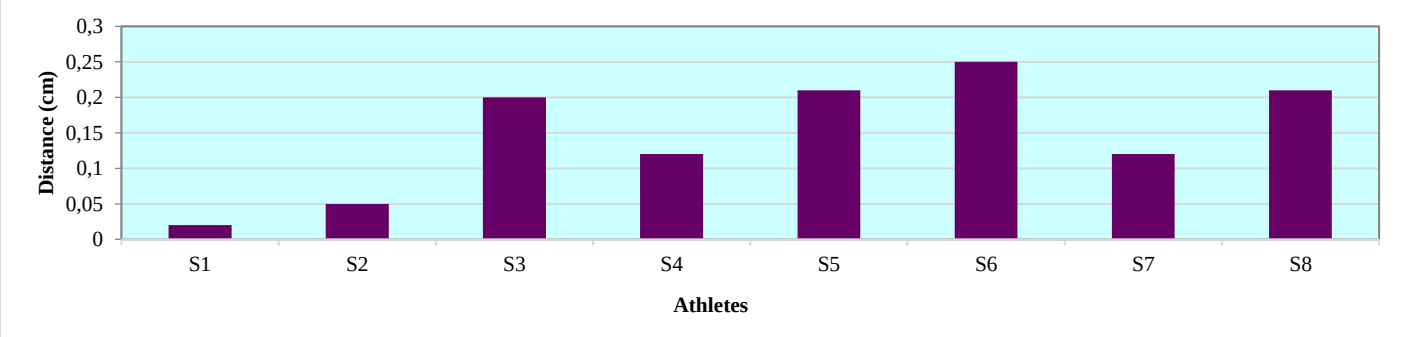

Figure 1. Throwing Accuracy Analysis of pointing in a standing position

The data in these conclusions came from an analysis of 8 samples, which included the collecting of scores and the professional judgment-assigned average value for each athlete. Each athlete throws while standing,

which indicates the distance between the ball and the target. The investigation and analysis revealed that the ball's average distance from the target, which ranges from 0.02 meters to 0.25 meters, is 0.14 meters.

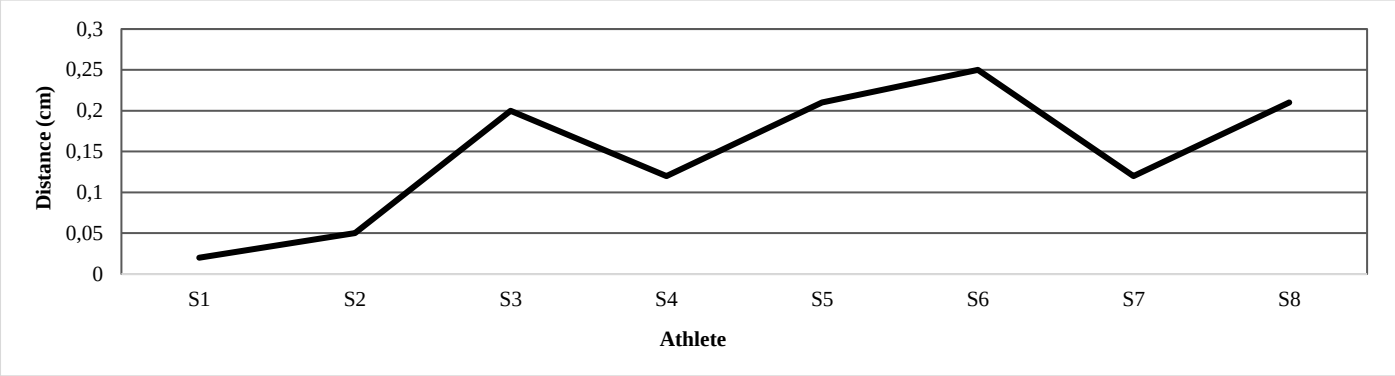

Figure 2. Ball Distance on Pointing

To find out the accuracy of the pointing in the standing position, it is necessary to assess the accuracy of the throw. That can be seen in Figure 3.

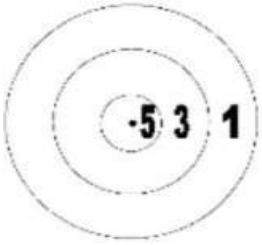

Figure 3. Target of Accuracy

Figure 3 shows an evaluation of the outcomes of this pointing using three circles. Where is each circle varies in size and value. The first circle is 100 cm in diameter and has a value of 1. The second circle is 40 cm in diameter and has a value of 3, while the last circle has a diameter of 70 cm and a value of 5. Figure 4 shows the measurements and calculations used to evaluate the accuracy of throwing from a standing position.

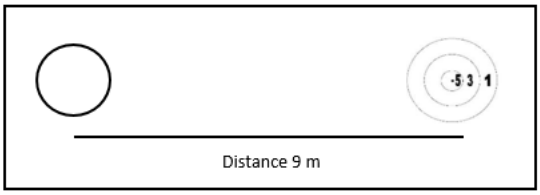

Figure 4. Score Position on Court

The ball stops in the direction indicated by the circle in Figure 4. The throwing range for pointing is 9 meters. The ball will receive a value of 5 if it stops in a circle with a diameter of 40 cm. The ball will receive a value of 3 if it stops on a 70 cm diameter circle. Additionally, if the ball stops on a circle with a diameter of 100 cm, it receives a value of 1, and if it exits the field or does not enter any of the three circles, it receives no value.

The result of the pointing throw in the form of a distance to the boka has an average of 0.14 meters, which is included in the "precise" category. The results can be said to be “precise” because they are based on data from the analysis results and an assessment carried out by the assessment team or experts. They also refer to the pointing accuracy assessment guide, where a score of 5 is considered precise. The results of the assessment can be seen from the results of the throwing accuracy assessment using the throwing accuracy assessment form assessed by the appraiser, namely on behalf of HT as a trainer and also the administrator of FOPI Semarang City.

The corresponding throwing movements of the backswing, swing, and release movements can produce appropriate and precise throws (Ghassani & Irawan, 2022a). Compared with previous studies conducted by Paulina & Irawan (2022), it can be seen that the results of the suitability analysis on the pointing of the squat position carried out at a distance of 7 m in petanque athletes of Semarang Regency got an overall average score of falling into the "appropriate" category. Looking at the previous research conducted by Ghassani and Irawan (2022b) mentioned that the effective pointing throw was carried out at a distance of 9 m with a standing position, namely with a backswing angle of 37.1º-148º, and the angle when released was 81.7º-107º, and the maximum ball height was 1.65-4.69 m. The four components influence each other to produce a throw that is close to the target.

Based on these findings, pointing with a squat position is very appropriate and effective when done at an ideal distance, such as 6 m, 7 m, or 8 m. While pointing in a standing position is effective if it is done at long distances, such as distances of 9 m, and 10 m. This is due to if you expose it in a standing position at a distance, it can provide a wide field of view of the right fall point of the ball, so that the ball can stop close to the target. But it should be noted that external factors such as different field conditions and the need for adjustments to which pointing techniques are suitable for use in the field. Based on the results of observations made by researchers during the study, it is known that the pointing throws made by each athlete have different throwing characteristics, but an equation can be put into a pointing movement that is following biomechanics so that the same and consistent throwing accuracy occurs. The athletes skills has specific characteristics on every throwing style and should have effective movement to reach the target (Irawan & Munir, 2021b).

The results of these tests demonstrate that the pointing movement from the standing position is influenced by many variables, including the backswing angle, swing, release angle, and ball height. There are other indicators besides how each athlete's height and arm length affect performance. Thus, planning the pointing movement from a standing posture at a distance of 9 meters is crucial to producing a consistent and stable throw. The analysis's results may also help to improve how well athletes practice and move so that they can execute precise motions that follow sports biomechanics. Figure 5 illustrates the throwing motion of the standing posture through three phases of pointing.

Figure 5. Pointing Phase in a Standing Position

From this study, to get a good pointing throw result, it is necessary to pay attention to the time of backswing, swing, release, and ball height movements. The backswing angle will affect the swing speed, while the swing speed will affect the release angle. When releasing the ball, if the release is done too quickly, the ball cannot reach its maximum height. Meanwhile, if the release angle is too small, the resulting elevation angle will be small as well. When the ball is released at the right time, it will affect the height and speed of the ball and will produce the right throw (Souef, 2015; Geçitli et al., 2021). Pay particular attention to each throwing motion to develop your standing posture and pointing movement abilities, which will enhance performance and reduce the danger of injuries. These techniques can boost performance and cut the risk of sports injuries by as much as 50% (Irawan & Long-Ren, 2015a, 2015b). Athletes with quadriplegic athetosis, hypertension, or ataxia

may find it difficult to throw well due to the need for motor control and good upper extremity coordination, according to certain findings from previous studies (Reina et al., 2018).

In a study by Setiakarnawijaya et al. (2021), it was discovered that the accuracy of pointing in petanque was correlated with both arm length and arm muscle endurance. In petanque, arm muscle endurance is necessary because with strong arm muscles, athletes may use throwing tactics, particularly in making precise pointing throws (Fong et al., 2012; Huang et al., 2014). Athletes must strengthen their arm muscles to achieve the necessary throw to increase throwing performance. The dumbbell swing exercise is one of the workouts that can be done, and it helps improve arm strength (Isknadar et al., 2019; Badaru et al., 2021). So that pointing skills in athletes can be effective and efficient, the pointing skills training model in athletes can be utilized and improved in training (Pelana et al., 2021a). According to Japanese research, athletes' accuracy can be increased by sharpening their cognitive skills by watching different films. Athletes can learn how to execute a technique so that their motions correspond to what they envision by repeatedly watching and studying films about it (Hiromitsu & Ishikura, 2021).

Shooting skills can be impacted by the mechanism, focus, and coordination of the hand-eyes, according to Agustina and Priambodo (2017). It is necessary for both of shooting and pointing procedures. Additionally, Sarnowska et al. (2018) that concentration can be an important part of petanque's game when making adjusted pointing throw during matches. Other determining variables in supporting petanque sports success are arm muscle strength, height, arm length, arm endurance, explosive power, wrist flexibility, eye-hand coordination, and balance (Wahyudhi et al., 2021; Kristanto & Nurkholis, 2020; Pradana & Nurkholis, 2019; Agustini et al., 2018; Purnomo & Yendrizal, 2020; Pelana et al., 2021b; Pelana et al., 2019). Similarly, research conducted by Nurfatoni et al. (2018) claims that balance, wrist flexibility, torso flexibility, and hand-eye coordination all have a role in throwing, both concurrently and in part. It also influences the pointing while standing, where the backswing, swing, and release are all indirectly influenced by eye-hand coordination.

Petanque sports can also be influenced by physical elements such as physiological, biomotor, anthropometric, and psychological aspects (Amalia et al., 2019; Rony et al., 2021; O'Connor et al., 2019; Rizal et al., 2020). It takes poise, balance, and accuracy to toss the ball. The pace of the ball will not be straight with the target and will be far from it if the athlete's body falters or stands unsteadily (Phytanza et al., 2022). Therefore, the athlete himself must maintain composure, concentration, and coordination. So that it can become more consistent in the performance presented in each match and gradually increase the athletes' performance (Irawan et al., 2021c; Irawan et al., 2021a). Warming up and precooling before workouts and games should be taken into account, as these two activities have a significant impact on muscle endurance (Rajeswaran et al., 2011). A precise pointing throw is then produced by knowing how to make a solid backswing, swing, and release as well as figuring out where a good landing point can result in a ball that stops as close to the target as possible or even sticks to a wooden ball.

An understanding of how to do pointing and shooting is needed to improve the performance of the athletes themselves. Improvements and varied training models can be given to athletes to support improving their performance and the consistency of each throw they make. Athletes' performance can be influenced by factors other than training, such as their nutritional intake. According to research by Herpandika et al. (2019), to provide a good exercise program, it is also necessary to pay attention to athletes' nutritional status. Therefore, it is necessary to pay attention to each athlete's nutritional status to support their performance.

CONCLUSION

The results of the pointing analysis of standing positions at a distance of 9 meters show that the average distance between the ball and the target is 0.14 m where the results fall into the "precise" category based on the accuracy assessment instrument. These results support the notion that the backswing, swing, and release movements are carried out with utmost precision to provide effective performance. For a successful throw and for the ball to land in the proper landing position so that it stops close to the target, it is crucial to pay attention to the backswing, swing, release, and height of the ball. This study contributes that an accurate pointing throw must be based on good and correct movements in each phase. In addition, the accuracy of the pointing must be as close as possible or even stick to the ball target. It is hoped that the discussion on how to make the right-

pointing can help improve the performance of each athlete. This study is focused on the throwing distance produced by each athlete, so it cannot analyze every value generated by an athlete. Further, research can analyze the backspin technique of pointing in a standing position to complement the current research data.

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CONFLICT OF INTEREST

The author states there is no conflict of interest in preparing this article.

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