

Literature Study: Factor Analysis of Dominant Physical Conditions in the Sport of Petanque

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Abstract

The problem faced by coaches so far is that the dominant physical condition factor in the sport of petanque is not known yet, so that coaches have difficulty in planning training programs as well as looking for athlete talent. Based on these problems, considering that petanque is a newly developed sport in Indonesia, this research has an urgency to find out the dominant physical condition factors in petanque. This research is a qualitative analysis using the literature review method or literature study. The method of collecting data samples in this study was carried out by searching for relevant journals or articles in the research journal database and searching via the internet. The databases used include: Google Scholar and Researchgate. Articles or journals that match the review criteria and have a correlation with the analysis of physical condition factors in petanque sports, then reviewed and analyzed the content contained in the research objectives and outcomes or research findings. From the results of the article search, 9 articles were identified that had related and interconnected topics. After thorough analysis, it was found that the most dominant physical conditions in the sport of petanque that were most often reviewed, and the most dominant in the total of all articles included arm muscle strength, wrist flexibility, balance, and eye-hand coordination.

Keywords: physical condition, dominant, petanque.

INTRODUCTION

Petanque is a sport that uses bosi (iron ball) which is thrown towards the target, namely boka (wooden ball) and the opponent's bosi with the intention of bringing the bosi closer to the boka and keeping the opponent's bosi away to get points (A. T. Ashari & Apriani, 2023). Petanque can be played by all ages from young to old because in this sport it is not required to make difficult movements and requires a lot of energy (Fatchurrahman et al., 2019). Petanque is a new sport in Indonesia, which relies on several aspects such as concentration, accuracy, and precision, with the main purpose of achieving maximum accuracy (Bustomi et al., 2020). In addition to demanding accuracy, petanque sports need to be supported by other aspects that cannot be separated in the development of sports achievements, one of which is the aspect of physical conditions (Hanief, 2022).

Physical condition is the most important component in achieving achievements (Fauzi, 2022; Wulandari & Jariono, 2023). Maximum performance will be achieved when a good physical condition as a basic foundation is being fulfilled and supported by the perfect quality of training (Mansur et al., 2020). Having a good physical condition is an important requirement for an athlete in improving and developing optimal sports performance, so that all physical conditions must be developed and improved according to the characteristics and needs of for each sport (Prima & Kartiko, 2021; Supriyoko & Mahardika, 2018).

The problem faced by coaches so far is that the dominant physical condition factor in the sport of petanque is not known yet, which makes it difficult for coaches to develop training programs. This is supported by (Amalia et al., 2019) which states that there are not known yet what are the factors that affect the dominant performance that must be trained so that it will affect the accuracy of the throw. During this time the coaches only assume that the physical condition needs in petanque sports are almost the same as sports with the characteristics of throwing at targets, such as handball, basketball, golf and others (Hanief & Purnomo, 2019). There are several components of physical condition that need to be considered including eye-hand coordination, arm muscle strength, height, wrist flexibility, arm length, concentration, and balance (Agustini et al., 2018; K. Ashari & Yulianti, 2022; Mudhalifa, 2018; Widodo & Hafidz, 2018).

There have been many studies conducted relating to physical conditions in the sport of petanque. At least 395 articles were found anytime in the Google Scholar database with the keywords “petanque” AND “physical condition” with the type of publication in journals, proceedings, and repository. Among them, research conducted by (Kristanto & Nurkholis, 2020) concluded that height, arm length and concentration determine shooting accuracy. In addition, (Hanief & Purnomo, 2019) also explained that the dominant physical factors determining petanque achievement are height, arm length, arm muscle strength, wrist flexibility, balance and hand eye coordination. Based on these problems, considering that petanque is a newly developed sport in Indonesia, this research has an urgency to find out the dominant physical factors in petanque sport.

METHODS

This research is a qualitative research using the literature review method or literature study. The method of collecting data samples in this study was carried out by searching for journals or articles in the research journal database and searching via the internet. The databases used include: Google Scholar and Researchgate. Data were selected through four phases, which are identification, screening, eligibility, and those that fit the review criteria (included). Articles or journals that fit the review criteria and have a correlation with the analysis of physical factors in the sport of petanque, then reviewed and analyzed the content contained in the research objectives and results or research findings. Articles or journals that have been reviewed are then organized based on the point of the research and described in a sentence that explains the similarities and differences of each study. The resulting data are then discussed to make a conclusion.

The inclusion and exclusion criteria used by researchers in data sampling are:

- a. Articles are sourced from google scholar and Researchgate databases.
- b. The article discusses the aspects of physical condition that are limited to anthropometric and biomotor aspects. Anthropometric aspects include height and arm length. While biomotor aspects include arm muscle strength, wrist flexibility, balance, and eye-hand coordination.
- c. Articles have been published in reputable international and accredited national journals at least Sinta 4, not repository articles.
- d. Articles have an accessible fulltext.
- e. Articles published in 2014-2023.

RESULTS AND DISCUSSION

Based on the keywords that have been entered on Google Scholar and Researchgate, 395 articles were found on Google Scholar and 12 articles on Researchgate, resulting in a total of 402 articles that discussing about physical conditions and petanque were found. Furthermore, screening based on inclusion and exclusion criteria, 9 articles were found that could be used as data samples which were then analyzed. The data samples to be analyzed are presented in Table 1 below.

Table 1. Sample Data Literature Review

No	Author, Year	Article Title	Results
1	(Hanief & Purnomo, 2019)	Petanque: What are the physical factors that determine performance?	The variables of height, arm length, arm muscle strength, wrist flexibility, balance, and eye-hand coordination are factors of the anthropometric and biomotor variables that determine petanque performance.
2	(Amalia et al., 2019)	Physical and Psychological Performance Factors of Petanque Sport	1) Anthropometrics has no effect on performance. 2) Biomotor and physiological have a positive effect on performance. 3) Psychological has a negative effect on performance. The variables that have an effect are wrist flexibility, balance, aerobic capacity, anxiety and self-confidence.
3	(Maliki et al., 2022)	Analysis of pointing success factors in petanque athlete	Component 1 (variables of concentration, eye-hand coordination, and kinesthetic perception) has an effect of 42.937%. Component 2 (variables of arm muscle strength, wrist flexibility, and balance) has an effect of 19.403%. Component 3 (arm length variable) has an effect of 13.508%.
4	(Rhamadhan et al., 2023)	Shooting Ability of Petanque Athletes in Palopo: The Role of Physical Conditions and Kinesthetic Perceptions	Based on the results found in the field, aspects of physical condition (arm muscle strength, eye-hand coordination, balance) and kinesthetic perception have a positive correlation with the shooting ability of petanque athletes in Palopo City. The results showed that there was a significant correlation between physical condition and kinesthetic perception on shooting ability.
5	(A. T. Ashari & Apriani, 2023)	Correlation of Height and Arm Muscle Strength to Accuracy of Shooting Results in Petanque UKM UIR	1) here is no correlation between height and shotting accuracy of UIR petanque UKM with a value of $r_{count} < r_{table}$ ($0,28 < 0,53$) and the coefficient of determination is 7,8%. 2) There is a correlation between arm muscle strength and the accuracy of shotting of UIR petanque UKM with a value of $r_{count} > r_{table}$ ($0,57 > 0,53$) and the coefficient of determination is 32%, dan 3) There is a correlation between height and arm muscle strength on the shotting accuracy of UIR petanque UKM with a value of $r_{count} > r_{table}$ ($0,606 > 0,53$) and the coefficient of determination is 36%.
6	(Irawan et al., 2019)	Biomechanical Analysis of Concentration and	There is a correlation between concentration and coordination on shooting accuracy in petanque athletes. Athletes who have high

		Coordination on The Accuracy in Petanque Shooting	concentration and coordination can certainly control the game and athletes who have shooting weaknesses can improve concentration and coordination with intensive and continuous training focus.
7	(Sani & Hulfian, 2022)	The Correlation Between Arm Muscle Strength and Hand Eye Coordination with Shooting Accuracy in Petanque Sport at MBC (Masbagik Bocce Club)	1) There is a significant correlation between arm muscle strength and shooting accuracy in Petanque sport at MBC (Masbagik Bocce Club) with the value of $r_{x2,y} = 0,561 > r_{(0,05)(20)} = 0,444$. 2) There is a significant correlation between hand eye coordination and shooting accuracy in Petanque sport at MBC (Masbagik Bocce Club) with the value of $r_{x3,y} = 0,740 > r_{(0,05)(20)} = 0,444$. 3) There is a significant correlation between arm muscle strength and hand eye coordination with shooting accuracy in Petanque sport at MBC (Masbagik Bocce Club) with the value of $R_{count} = 0,896 > R_{table} = 0,444$.
8	(Massa & Pulungan, 2023)	The Influence of Leg Muscle Strength and Static Balance on Shooting in Petanque Sport	1). There is a significant relationship between leg muscle strength and shooting results of 0.4290 (49.90%). 2). There is a significant correlation between static balance and shooting results of 0.4556 (45.56%). 3). There is a significant correlation between leg muscle strength and static balance on shooting results of 0.6395 (63.95%).
9	(Ramadhini et al., 2023)	Eye-Hand Coordination, Static Balance with Shooting Accuracy of UKM Petanque UIR Athletes	1) There is no correlation between eye-hand coordination and shooting accuracy of UIR petanque athletes with a value of $r_{count} = -0,062 < r_{table} = 0,468$. 2) There is no correlation between static balance and shooting accuracy of UIR petanque athletes with a value of $r_{count} = 0,294 > r_{table} = 0,468$. 3) There is a correlation between hand eye coordination and static balance on the shooting accuracy of UIR petanque athletes with a value $r_{count} = 0,611 > r_{table} = 0,468$.

From the results of the literature study of 9 articles that have been described previously, there are several topics that are related and interconnected. From the anthropometric aspect, (Hanief & Purnomo, 2019) states that height and arm length are included in the anthropometric variable factors that determines petanque achievement. Supported by a statement from (Maliki et al., 2022) Supported by a statement from (Maliki et al., 2022) which states that arm length has an influence on pointing. Meanwhile, according to (Amalia et al., 2019) anthropometrics have no effect on performance. (A. T. Ashari & Apriani, 2023) also stated that there was no correlation between height and shooting accuracy, although together with arm muscle strength it was stated that there was a correlation with the accuracy of shooting.

In terms of biomotor aspects, (Amalia et al., 2019) explains that biomotor and physiological (wrist flexibility, balance) have a positive effect on performance. According to (Hanief & Purnomo, 2019;

Maliki et al., 2022; Rhamadhan et al., 2023) arm muscle strength, wrist flexibility, balance, and eye-hand coordination are members of the biomotor variable factors that have an effect in the sport of petanque, both in pointing or shooting. There is a correlation between concentration and coordination on shooting accuracy in petanque athletes (Irawan et al., 2019). It was also stated that there is a significant correlation between static balance and shooting results of 0,4556 (45,56%) (Massa & Pulungan, 2023).

CONCLUSION

After a thorough analysis, it is discovered that the most dominant physical conditions in the sport of petanque that are most often studied, and the most dominant in the total of all articles include arm muscle strength, wrist flexibility, balance, and eye-hand coordination. The results of this study are expected to be a reference for coaches in improving the performance of petanque athletes in the aspect of physical components. This research is a literature review, therefore, there are limitations to this research, namely that the author cannot conclude further regarding the most dominant physical conditions in the sport of petanque, the author can only synthesize from this many articles.

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