

## The Effect of Leg Muscle Strength, Leg Flexibility and Balance on the Ability to Service Sepaktakraw: Literature Review



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**ABSTRACT:** To determine the effect of leg muscle strength, leg flexibility, and balance on the ability to serve sepaktakraw. : the method used is to review literature and identify problems with meta-analysis techniques. Identify published articles from 2019 – 2023 related to the influence of leg muscle strength, kick flexibility, and balance on the ability to serve sepaktakraw using relevant databases (Google Scholar Database, Science Direct and Pubmed) with predetermined keywords. Based on 10 research journals that have been conducted previously regarding the effect of leg muscle strength, kick flexibility, and balance on the ability to serve sepaktakraw, it is stated that balance is an influential factor in serving sepaktakraw. Where balance is a big influence in serving sepaktakraw. Balance is the most dominant factor in serving takraw.

**KEYWORDS:** Leg muscle strength, flexibility of the torso, balance, sepak takraw serve

### I. INTRODUCTION

Sepaktakraw is a traditional sport from Southeast Asian countries including Indonesia (Agustinus & Samsudin, 2013). In achieving maximum sporting achievements, especially the Sepaktakraw Service, an athlete is required to master a series of complex movements supported by several physical components so that they become a unified movement. Playing Sepak Takraw needs to be supported by several factors, namely physical, technical, tactical and mental factors (Hidayat et al., 2020). Efforts to create increased performance are complex problems, apart from being supported by adequate facilities and infrastructure, supervision and guidance for athletes by teachers or coaches is also needed, and there are many factors that contribute to increasing the achievement of an athlete.

Looking at the needs and dimensions of the athlete's leg muscle power in performing the sepaktakraw service, it is still minimal due to the physical condition and the method or form of training which has sufficient intensity, inadequate facilities and infrastructure, and coaches who contribute in training and training which is still in the traditional form without Collaborate according to current developments.

Based on previous research, efforts to improve athlete performance are a complex problem, apart from adequate facilities and infrastructure, guidance and direction from teachers or coaches is also needed, and many factors that influence increasing performance are not easy. One of the factors that is considered to be very influential in increasing the achievement of sepaktakraw sports is the capacity of an athlete's physical condition (Novrianto, 2013). Based on the influencing factors above, the solution in reducing the injury of a sepaktakraw athlete is to test the physical conditions that will support the performance and achievements of an athlete.

Based on relevant studies and various sources, the authors can conclude that an athlete's physical performance and performance are marked by good physical condition. Where the athlete's physical condition that supports consists of leg power, balance and flexibility to serve in the game of sepaktakraw. Some physical components that need to be considered for development are cardiovascular endurance, strength endurance, muscle strength (strength), flexibility (flexibility), speed, stamina, agility (agility), muscle explosiveness (power), endurance strength (strength endurance). ), (Bompa & Buzzichelli, 2015). Keeping in shape like that increases the chances of winning a game. The chances of winning are greater due to the athlete's endurance and significant physical condition. Treatment and type of exercise must be adjusted to achieve stable resistance.

Leg muscle strength is the ability of the muscles to receive loads and provide muscle contractions to exert force on the player's limbs for a certain time. It can be concluded that leg muscle strength is an element of the physical condition that drives every activity and works in one contraction against special resistance and loads According to Zulfa & Kurniawan (2020). A person's

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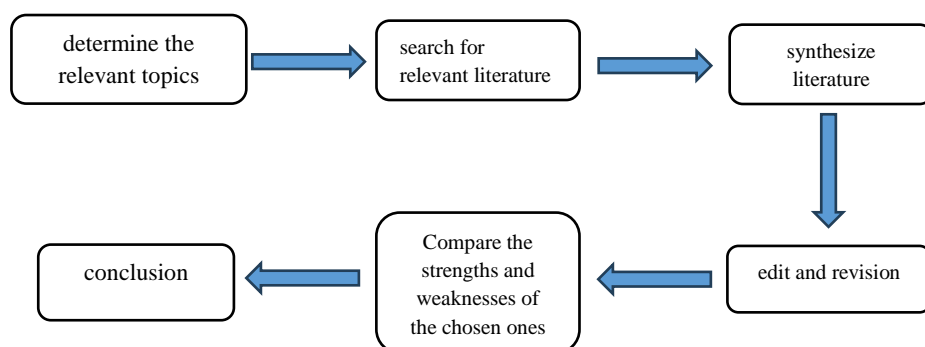
flexibility is determined by the ability to move the joints with joint relaxation exercises that allow wider joint motion (Sudarsini (2016: 76). Meanwhile Harsono (2018: 35) explains the limitation of flexibility is the ability to perform movements within the range of motion of the joints and flexibility is also determined by the elasticity of the muscles, tendons and ligaments around the joints.

Balance is a key component of postural stability and motor skills. It also has a key role for complex sports performances. Balance is one of the biomechanical parameters that can affect the performance of sepaktakraw players and can be used as an important parameter for identifying talent in sepaktakraw.

### II. METHODOLOGY

The research method used is literature review. The research method used is the meta-analysis method. The meta-analysis method is a method that is used to evaluate several research findings on related issues (Muktiani, Rachman & Rahayu, 2019). The steps of this research are as follows: (1) determine the relevant topics, (2) search for relevant literature, (3) synthesize literature, (4) edit and revision, (5) Compare the strengths and weaknesses of the chosen ones, and (6) conclusion.

The purpose of using this method is to obtain information with the strength of scientific sources. This research review is taken from journals, articles, books or literature reviews that are relevant to the contents of the related issues. Analysis data collection techniques used the Google Scholar Database, Science Direct and Pubmed. Meta-analysis is a method for summarizing various research results quantitatively. The data collection technique is a meta-analysis method using Google Scholar and Database (Science Direct). Search using Indonesian keywords, leg muscle strength training, limb flexibility, balance and sepak takraw. The data analysis technique is using Thematic Analysis.



### III. RESULT AND DISCUSSION

The following is an analysis table from the sources of articles reviewed or reviewed

Author (Year)	Title	Purpose	Design / Population	Result
Darrie Leonda Arya Wisnu Murti, ett all (2020)	The Effect of Leg Muscle Strength, Leg Flexibility and Balance on Sepaktakraw Service	This research was conducted to examine the influence of leg muscle strength, leg flexibility and balance on the sepak takraw service	Eksperiment / 44 Athlete	In this study, the biggest influence or contribution in performing the sepaktakraw service was balance with a percentage value of 0.333.
Mardis, et all (2020)	The Relationship between Leg Muscle Strength and Balance Against the Ability of Silas in the Sepaktakraw Game of Cokroaminoto	aims to prove the existence of a relationship between leg muscle strength and balance on the ability to kick Silat in	Eksperiment Korelasi / 40 person	The relationship that has the most contribution is found in the balance with a value of 0.840.

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	Makassar High School Students.	the game of sepaktakraw.		
Alvi Akbar,et all (2021)	The contribution of flexibility, balance and muscle strength in the lower limbs with the ability to serve in sepaktakraw athletes	To determine the contribution of flexibility, balance and leg muscle strength to the ability of the athlete's serve in sepaktakraw	Eksperiment Korelasi / 15 sepaktakraw athletes	The biggest contribution in serving sepaktakraw is in the balance with a value of 71.61%.
Didin Tohidin, et all (2021)	Study of service ability in sepaktakraw (effect leg muscle, flexibility and self confidence of service abilities)	The purpose of this study is to see the effect of physical conditions and psychological conditions that directly and indirectly affect the ability to serve Sepaktakraw,	Path Analysis / 40 sepaktakraw athlete.	The results in this study had a direct effect on the serve at 39.81% and an indirect effect on the serve was found in the explosive power of the leg muscles with a percentage value of 19.2%.
Sahabuddin, S., Fadillah, A. (2022)	The Contribution of Flexibility, Balance and Leg Muscle Strength to Service Ability in the game of Sepaktakraw	To find out the contribution of flexibility, balance, and leg muscle strength to the ability to serve in the game of sepak takraw.	Deskriptif / 40 student	The biggest contribution in serving sepak takraw is owned by the balance with a magnitude of 74.4%.
Akbar, A., Donie, D., Ridwan, M., & Padli, P. (2021)	The Contribution of Flexibility, Balance and Muscle Strength of the Lower Legs with the Service Ability of the Sepaktakraw Athletes	To find out how much the contribution of flexibility, balance and leg muscle strength to the ability of the athlete's serve sepaktakraw	Eksperiment Korelasi / 15 Athlete	The biggest contribution in serving sepak takraw is in the balance of 71.61%.
Jufrianis, Akbar, James Tangkudung (2018)	The Effect Of Eye-Foot Coordination, Flexibility Of The Limbs, Body Balance And Self-Confidence To The Accuracy Of The Football Of Sepaktakraw	The purpose of this study was to determine the effect of eye-foot coordination, limb flexibility, body balance and self-confidence on the accuracy of playing sepaktakraw.	Path Analysis / 40 Athlete	In this study, eye-foot coordination was the biggest contribution in playing sepak takraw with a percentage of 6.94%.

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Sudarso (2022)	The Influence of Leg Muscle Strength and Balance on the Accuracy of Sepaktakraw Service at the Surabaya Sepaktakraw Academy	The aim is to determine the effect of leg muscle strength and balance on the accuracy of the sepak takraw service.	Pre Experimental designs / 30 person	In this study the biggest influence in making service decisions is balance with a significant value of 0.679.
La Robi (2021)	The Correlation between Balance and Leg Muscle Strength on Servicing Ability in the IV Semester Physical Education Student's Sepaktakraw Game at Unimuda Sorong	The research objective was to determine the relationship between balance and leg muscle strength on serving ability	Korelasional design / 33 university students	The results in this study that the greatest relationship in serviceability is found in Balance with a value of 0.009 or 0.90%
Muhammad Rusli, et al (2022)	Relationship between leg muscle power and service ability in the game of Sepaktakraw	to determine the relationship between leg muscle power and service ability in the game of sepak takraw	Korelasional design / 31 student	The results in this study the relationship between leg muscle power and serving ability is very large with a value of 0.49

After carrying out a literature review, the research data were carried out in the selected journals, and then an analysis and discussion were carried out. Article Analysis This review reviews 10 journals, from several international and national journals which have years of publication ranging from 2019 to 2023. The research methods used are experimental, descriptive research and meta-analysis. The average research subject used is fifteen to forty-five subjects who are examined. After reviewing the data and the results of the analysis, it was found that as many as 10 journals that had been reviewed stated that balance is an influential thing in the sepak takraw service. The Sepaktakraw service is one of the elements of the Sepaktakraw game itself, where the Sepaktakraw service is the beginning of the Sepaktakraw game itself. Differences in athletes regarding balance will be an important consideration in determining the method of balance training in achieving a good serve in the game of sepak takraw. The success of an athlete in performing the sepak takraw service requires systematic and structured training, in order to achieve good performance and accuracy of serving to provide maximum results. Balance can be trained with various tests such as : standing stork test, standing stork test-Blind, dynamic balance test, Y Balance Test, Star Excursion Balance Test (SEBT), to provide increased balance and allow athletes to understand and strengthen the leg and calf muscles in serving. Balance is the ability possessed by a person to maintain the center of gravity of the fulcrum when in an upright position (Darrle et al, 2020). Balance is a complex interaction of integration/interaction of sensory systems (vestibular, visual, and somatosensory including proprioceptors) and musculoskeletal (muscles, joints, and other soft tissue) that are modified/regulated in the brain (motor control, sensory, basal ganglia, cerebellum, association area) in response to changes in internal and external conditions (yulifri, et al 2019). By doing good and effective balancing exercises, you can improve your performance in serving sepak takraw, which not only strengthens punches or kicks, leg muscle strength but also plays a role in the quality and ability of athletes to serve. With the influence of balance in performing the sepak takraw service, it is hoped that athletes or students can further strengthen their physical condition in the game of sepak takraw to avoid fatal injuries.

#### IV. CONCLUSIONS

Based on a review of data analysis results from 10 journals, it was concluded that in the game of sepak takraw, especially in service, the most influential thing or physical effect is balance which is the most dominant factor so that kicks or kicks depend on the balance of an athlete himself.

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### ACKNOWLEDGMENT

1. Based on the results that have been obtained, it is hoped that the analysis from this review article can be used as a reference for coaches to further improve athlete performance by conducting measurement tests.
2. The trainer must also pay attention to other supporting factors apart from the physical, need to know external factors in order to achieve a predetermined training program.
3. By knowing that there is a big influence on the game of sepaktakraw, it is expected that coaches and athletes will be motivated to be more active. Exercises to improve the skills of playing sepaktakraw.
4. It is hoped that the analysis of review articles will further review literature journals with a larger number and use the most recent year of publication.

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