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LITERATURE REVIEW : ANALYSIS OF PHYSICAL CONDITION REQUIREMENTS IN SEATED VOLLEYBALL GAMES

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Abstract This literature review aims to determine several aspects of the physical condition requirements in sitting volleyball games. The method used is literature observation from three electronic databases including Google Scholar, PubMed, and ScienceDirect. This study is based on an examination of 5 studies published between 2013 and 2023 using the SPIDER or Sample, Phenomenon of Interest, Design, Evaluation, and Research analysis types. The sample used in the reviewed article is elite seated volleyball athletes in their country. The results of the literature review of the 5 articles used in this literature insight show that aspects of physical condition in the sitting volleyball game are very much needed, especially in the upper body and in the training process you must pay attention to various aspects including gender, identification of injuries and type of classification, namely VS1 (heavy) and VS2 (light). The conclusion from this literature review is that regularly programmed and organized management of physical condition aspects can improve the ability to play seated volleyball in athletes with disabilities.

Keywords: physical condition and sitting volleyball

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INTRODUCTION

Sitting volleyball (SV) first appeared at the Summer Paralympics in 1980 in Arnhem, the Netherlands and is still one of the most popular team sports at the Paralympics. The rules of the SV game are similar to standing volleyball with several exceptions including a smaller court, the net is set lower, the athlete's position on the court must be sitting and is determined by the buttocks and if the buttocks are raised then a foul occurs and the opposing team gets one points. Athletes can also receive points by blocking their serves (Wordl paravolley board of directors & Technical Sub-committee, 2017)

SV matches are dynamic and full of short actions, as in standing volleyball, where it is necessary to find several determining factors for success in a match or to examine the relationship between player skills, physical condition, match period, and match. A scientific approach should be used to improve athlete performance and to select outstanding athletes and training programs for elite sports, especially sitting volleyball.

One of the important fundamental steps of a scientific approach is the systematic collection of empirical data from various scientific journals. Previously, many sports scientists have investigated various characteristics such as physical fitness, kinanthropometrics, psychology, and motor function in elite athletes (Marszałek et al., 2018). Elite athletes are studied because it is assumed that by being at the peak of their sport, their physical fitness, physical condition, kinanthropometrics, psychology, and sporting performance abilities will be in ideal conditions. This approach also applies to sports for people with disabilities. It is assumed that elite sports for people with disabilities also require optimal physical conditions for the type and characteristics of each sport, and physical fitness is fundamental for good performance (Aouadi et al., 2012). Because sitting volleyball players can receive the ball from any direction and must pass it on to the next game, either by attacking or defending, they must immediately make decisions and move and must be agile and have endurance and power. In addition, they need height and strength to drop the ball in the opponent's court. Stamina factors, physical condition and physical fitness influence performance so that physical fitness is a fundamental factor for high skill and training strategies. The participation of individuals with physical disabilities in the sport of seated and competitive volleyball is perhaps the most debated area of the entire sporting

field. Strength and physical ability are generally required in sports, especially handicap sports, including competitive seated volleyball (Vute, 1999). Because most sitting volleyball players have lower body limitations, it is important for them to have upper body physical fitness, core muscle strength, and good balance in the sitting position (Lee and Kim, 2010). The rules of the sitting volleyball game stipulate that teams may touch the ball 3 times, and on the third touch, team members must try to direct the ball to the opponent's side of the court in an attempt to score points. Players can move using their hands and glide across the field, but the player's actions are determined by the position of his buttocks. Players use their hands to move and glide across the playing court, and their buttocks must remain on the floor when playing, blocking, and serving. At least one part of the player's buttocks must remain on the floor when the ball is in play, namely when passing (receiving, throwing), attacking, blocking and serving. To perform volleyball skills well according to these rules, a high level of physical condition is required (Jeoung, 2017), 2004; (Marszalek et al., 2015). Coaches need to consider a player's level of physical condition when seeking to improve a player's training plan and game management.

On the basis of this phenomenon, this literature review was carried out for the purpose of identifying an analysis of the needs for physical conditions in sitting volleyball games. The aim of the literature review study is to obtain results from the analysis of physical condition needs in seated volleyball games in accordance with the general objective of optimizing physical condition capabilities for seated volleyball games, and physical fitness is fundamental for good performance (Aouadi et al., 2012).

METHOD

The design used in this research is a literature review or literature study. Literature review is a search and research of the literature by reading and reviewing various journals, books and various other published manuscripts related to the research topic to produce an article relating to a particular topic or issue (Esatbeyoglu et al., 2021). This literature study uses SPIDER which according to (Methley et al., 2014) can be used for qualitative research or other methods or a mixture of both. SPIDER is an abbreviation for Sample, Phenomenon of Interest, Design, Evaluation, and Research type. The SPIDER used by researchers includes the Sample (S) category which is a sitting volleyball athlete, Phenomenon of Interest

(PI) in the form of physical needs, Design (D) which is a questionnaire, Evaluation (E) which is a sitting volleyball game and Research type (R) is research. quantitative and qualitative conducted during the period 2013 to 2023.

The keywords used are "physical condition", and "sitting volleyball game". The selected articles are articles that meet the inclusion criteria: maximum journal publication deadline of 10 years (2013-2023), using Indonesian and English, original articles (research articles), research subjects in the articles are sitting volleyball athletes and articles are available in full text form. Search for research articles published on the internet via open access channels such as Google Scholar, Pubmed and ScienceDirect

RESULTS

After searching for scientific articles via *the Google Scholar, PubMed* and *ScienceDirect channels,* 5 articles were found that met the research inclusion criteria published between 2013 and 2023, namely as follows

Table 1. Characteristics of Analyzed Articles

Author Name, Article Title and Year	Research purposes	Research Design and Methods	Findings	Implications
Krzysztofik, M.; Matykiewicz, P.; Celebanska, D.; Jarosz, J.; Gawel, E.; Zwierzchowska, A. The Acute Post-Activation Performance Enhancement of the Bench Press Throw in Disabled Sitting Volleyball Athletes. Int. J Environ. Res. Public Health 2021	This study aims to assess: differences in power output levels and arm muscle power speed with your legs raised or your feet supporting the floor	Using experimental methods with a 2x2 factorial design	This research shows that the bench press movement performed with the legs raised can be increased by up to 60% 1RM to 10%. decrease in average speed of movement as a preconditioning activity in seated volleyball players Therefore, athletes and coaches can consider doing bench press exercises with the legs raised without reducing performance.	In this article, it is stated that upper extremity muscle strength is really needed. Bench press exercises can train the arm muscles and upper extremity limbs so that they do not place a burden on the disabled lower extremities.

Deddy Whinata Kardiyanto and Bambang Wijanarko, Anthropometrics and Biomotorics Indonesian Paralympic Seated Volleyball Athletes Judging from Injury Characteristics and Quality of Physical Condition, Sports Arena: Journal of Physical Education and Sports Volume 5, Number 1, December 2021	The aim of the research is to identify and analyze the anthropometics and biomotors of athletes with disabilities in sitting volleyball in terms of injury characteristics and quality of physical condition.	The research method used is descriptive quantitative. Data analysis used descriptive percentage analysis techniques with the help of the SPSS version 24.0 application.	The results of this study show that anthropometrics and biomotors in terms of injury characteristics and quality of physical condition are important components for improving the performance of sitting volleyball athletes in terms of injury characteristics and quality of physical condition.	The conclusion of the article states that one way to improve athlete performance and achievement is to identify injuries and the quality of the athlete's physical condition.
Shirko Ahmadi, Marco Carlos Uchida and Gustavo Luiz Gutierrez, Physical Performance Tests in Male and Female Sitting Volleyball Players: Pilot Study of Brazilian National Team Asian J Sports Med. 2019 June;	The aim of this study was to determine the differences in physical performance tests between men's and sitting national volleyball team players Brazilian princess.	Fifteen sitting volleyball national team players, (seven males, age = 33.7 ± 6.2 years; body mass = 88.4 ± 21.4 kg; height = 1.74 ± 0.36 m) and (eight women,	There was a statistically significant difference, between male and female Brazilian seated volleyball players with higher scores for men on MAT (27%, P = 0.001), SAT (22%, P = 0.008), SET (23%, P = 0.008) and SCP (19%, P = 0.03) scores.	Results showed that male players had higher scores on five performance tests, but according In effect size calculations, there is no significant difference between male and female players in HG performance.
Deddy Whinata Kardiyanto, Edi Setiawan Shoulder Muscle Strength and Arm Muscle Explosive Power: Do They	This study aims to analyze the correlation between shoulder muscle strength and arm muscle explosive power	A quantitative research approach with correlational descriptive methods was used in the research	The results of the research show that there is a correlation between shoulder muscle strength and the athlete's top serve skills, there is a	Thus, this research concludes that to have an optimal top serve, athletes must pay attention to the physical condition factors of shoulder muscle strength and

Have a Correlation with the Sitting Upper Serve Volley ball? Patriot Journal, Volume 4 Number 1 2022 (Pages 1-11)	on the top serving skills of Indonesian Paralympic sitting volleyball athletes.		correlation between the explosive power of the arm muscles on the athlete's top serve, and there is a correlation between shoulder muscle strength and the explosive power of the arm muscles simultaneously on the top serve of Paralympic sitting volleyball athletes. Indonesia.	arm muscle explosive power, because these two aspects contribute significantly to top serve performance.
Valentina Cavedon, Chiara Brugnoli, Marco Sandri, Luciano Bertinato, Lorenzo Giacobbi, Filip Bolčević, Carlo Zancanaro, and Chiara Milanese Physique and performance in males sitting volleyball players: implications for classification and training Article in PeerJ · October 2022	This study aims to assess whether anthropometry, physical fitness and sport are specific Sprint performance varied across the three seated volleyball (SV) groups athletes (athletes with disabilities (VS1), athletes with minimal disabilities (VS2) and able-bodied (AB) SV athletes to determine the validity of the current system	evaluation of linear anthropometry, physical fitness (body composition via dual energy X-ray absorptiometry and upper body strength) and sprint performance (5 meter sprint test, agility test, and speed and endurance test).	Athletes in the three groups differed in percentage of fat mass (%FM) viz higher in VS1 than AB at sub-total (C9%), in group (C15%) and in group levels unaffected area of the foot (C8%). The greater the hand span, the longer the interference at the bottom, %FM is lower at sub-total and regional levels and higher levels strength in the upper body were all associated with better performance under consideration sprint test (P < 0:05 for all).	These results do not confirm the validity of the current Athlete classification system adopted at SV. Professionals who work with SV athletes should include specific exercises aimed at improving the whole body and regional body composition and strength of the trunk and upper limbs in the training program.

DISCUSSION

Based on a literature review conducted by researchers, in general, physical needs are really needed because physical ability is the main support for the continuation of the sitting volleyball game,

this is proven by the opinion (Krzysztofik et al., 2021) who said that in this article it is stated that upper extremity muscle strength is really needed. Bench press exercises can train the arm muscles and upper extremity limbs so that they do not become burdened on the lower extremity which suffers. disability. Apart from the training that is carried out to increase muscle power and explosive power, there are several things that can influence the physical condition of sitting volleyball athletes, including types of classification, as stated by (Cavedon et al., 2022) which states that these results does not confirm the validity of the current athlete classification system adopted in SV. Professionals working with SV athletes should include specific exercises aimed at improving whole body and regional body composition and trunk and upper limb strength in their training programs. In this case (Kardiyanto & Setiawan, 2022) also concluded that to have an optimal top serve, athletes must pay attention to the physical condition factors of shoulder muscle strength and arm muscle explosive power, because these two aspects contribute significantly to service performance. on.

In this research there is also an opinion regarding gender also affecting endurance, this was conveyed by (Ahmadi et al., 2019) who said that male players had higher scores on five performance tests, but according to the effect size calculations there was no there is a significant difference between male and female players in HG performance

Then, in the process of physical ability in sitting volleyball athletes, attention must also be paid to ensure that the athlete does not experience excess training load during training, so that the athlete does not easily experience injury and the individual training needs of each athlete must be carefully considered, this is in accordance with the opinion (Kardiyanto & Wijanarko, 2021) who wrote that one way to improve athlete performance and achievement is to identify injuries and the quality of the athlete's physical condition. So training for good physical condition is training by paying attention to various aspects.

CONCLUSIONS AND RECOMMENDATIONS

The review of the entire article shows that the physical requirements in sitting volleyball are very necessary and in the training process you must pay attention to various aspects, including gender classification and identifying possible injuries to athletes. Then, to determine the training program, you must determine the physical condition requirements for the

basic techniques so that the training process can run optimally.

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