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Development of Standardisation of Physical Test Volleyball Men's Elite Athlete

Muhammad Arja Bahauddin[*1], Andun Sudijandoko[1], Irmantara Subagio[2], Muhammad[2], Achmad Widodo[1], Lutfhi Abdil Khuddus[3]

[1]*Department Sport Science, Faculty Sport Science and Health, State University of Surabaya, Indonesia.*
[2]*Departement Sport Coaching, Faculty Sport Science and Health, State University of Surabaya, Indonesia.*
[3]*Deparement Sport Management, Faculty Sport Science and Health, State University of Surabaya, Indonesia*
**Corresponding author: muhammadarja.22004@mhs.unesa.ac.id*

Abstract

In this research, no standardisation/category provisions apply specifically to the sport of volleyball according to what is required in the sport of volleyball. Paying attention to the research survey results regarding the standardisation of measuring instrument components, it is necessary to develop them from existing ones so that later, the results will be more comprehensive for male elite volleyball athletes. This research aims to create a physical fitness test for volleyball players by standardising the sport. The type of research carried out in this research is a type of development or Research and Development (R&D), which aims to develop an existing product. The instruments used to collect information are in the form of existing or previous secondary data. They are designed to be further improved in the form of questionnaires and written questionnaires of secondary data, which will be responded to by experts. Experts select existing test items that will be corrected or eliminated by designing them properly to determine their feasibility. Then, it was developed as a comprehensive physical test item for volleyball. This study used a Likert scale analysis to analyse the research results obtained from experts and several FIVB-licensed trainers. The research results provide the results of several physical test items that will be used, including the following: In the Flexibility component, use Sit and reach; in the Speed component, use 10-meter sprint; the explosive power component uses Counter Movement Jump and Vertical Jump Running test items, Endurance component uses Bleep Test (MFT), Upper body Strength component uses Medicine ball throw, Lower body strength component uses single leg squat right & lift, in the balance component using the standing balance test item, in the speed reaction component using the Digging Agility Test test item. This research concludes that standardising elite physical test items for male elite volleyball athletes still includes general physical tests.

Keywords: *Physical test items; standardisation; volleyball*

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INTRODUCTION

Volleyball is a big ball game that we often encounter in society. The development of Indonesian volleyball is increasingly rapid, as evidenced by the frequent holding of competitions, from the lowest level, for example, in rural areas, to international levels. This is solely to improve volleyball achievements on the national and international stage, as evidenced by the achievement of one of the Most Valuable Player of Volleyball awards at the 2017 Asian Senior Man Volleyball Championship for the Indonesian men's team. The Indonesian men's team also won the Asian Championship held in Vietnam in May 2018.

Jaya & Lumintuarso (2020), volleyball games use rally points and do not use time duration. The longer it takes to kill the ball in the opponent's area, the longer the time and period will last. Still, from several analyses, a volleyball game in 1 set is approximately 20-35

minutes. Therefore, excellent physical condition is essential for every individual volleyball athlete. The research that has been carried out, especially on physical conditions, still needs attention because when athletes have good physical condition, it will also benefit the body fitness and physical condition of volleyball athletes. The goal of volleyball is to develop athletes to achieve achievements and improve their performance. To achieve maximum volleyball achievements, it is necessary to have support from science and technology. Therefore, volleyball coaching in East Java is carried out at regional training centres in preparation for the National Sports Week event. Training is also a systematically scheduled and programmed process carried out repeatedly, with the training load increasing or increasing daily. Training is a process of change to be better than before, and aims to improve the performance of athletes; in volleyball games, physical condition is also one of the supports for athletes' performance in matches; therefore, in volleyball, physical condition is a very dominant part of the game. Noticed.

National Sports Week is an event held every four years. So currently, competition between provinces is getting tighter so that each region prepares its athletes who will compete. East Java men's elite volleyball in 2016 won a gold medal. However, in 2020, the East Java men's elite volleyball team could not qualify to reach the final. Therefore, for the 2024 PON, there is a need for extensive preparation. In preparation for the upcoming PON, it is essential to organise, especially regarding the physical condition of athletes according to the standardisation of the sport of volleyball. Training is a process that is structured systematically and programmed, carried out repeatedly over a relatively long period so that athletes' physical, technical, tactical, and mental abilities can support their achievements. Volleyball is a sport that has become popular in the community and can be played at all levels of society (Endriani et al., 2022). According to experts, volleyball is ranked second in the world after soccer. Balasas et al. (2018) in the game of volleyball, there are several elements of a series of techniques, namely passing, spike/smash, service, and block or dam. To find points by using the rally point system. From the previous statement, this matter needs to be approached scientifically so that the study and review include, among other things, the Aerobic and Anaerobic Energy System (ATP-PC).

Usman & Argantos (2020), the stronger the physical foundation, the greater the potential for developing technical, tactical, and physiological attributes. Therefore, the internal factors to achieve peak athlete performance are physical, technique, tactics, and mental, which are interrelated. The better the athlete's physical quality, the better the influence of the athlete's

technique and skills. The better both are, the less the coach will worry about preparing strategies for either individual athletes or teams. Sari & Subagio (2021) physical condition is one of the main internal factors, so to determine whether a volleyball athlete is good is the ability (physical fitness test) according to valid, reliable, and objective test items. Standardisation of physical training is the foundation for developing training factors related to development in the training (Bompa & Buzzichelli, 2019). Achieving the highest performance requires a coach to provide optimal standards to achieve achievement. The main target of physical conditioning training is improving the quality of energy and muscle fitness. Jatmiko et al., (2023) physical test items are an assessment for strength diagnosis or identification to monitor the effects of training intervention. The tests and measurements for each sport are different. Therefore, there is a need for analysis and standardisation of physical conditions to determine the physical abilities of volleyball athletes according to the volleyball sports guidelines. In the physical condition of volleyball, several components are recommended by "level 1 coaches Manual Federation International Volleyball (FIVB)": 36. There are ten physical test components: 1. Grip Strength, 2. Back Strength, 3. Vertical Jump, 4. Running Jump, 5. Block Jump, 6. Successive, 7. Both Leg Broad Jump Side Steps, 8. 9-meter Shuttle Running, 9. Forward Appeal Test, 10. Harvard Step Test. The physical components of the American Volleyball Coaches Association (AVCA) in 2017 that are appropriate and dominant for the sport of volleyball are eight physical component tests: 1. Anthropometry (height), 2. Anthropometry (standing Reach), 3. Block Touch, 4 Vertical Jump Test, 5. Attack Height, 6. Velocity, 7. Pro Agility, 8. Acceleration. This differs from the physical components the East Java men's volleyball team uses, comprising 15 components, almost all of which are physical tests. Using a test that resembles a form of training, there are various types of physical training for East Java male volleyball athletes in the research, (Bahauddin, 2022), namely: 1. Sit-up, 2. Single leg squat, 3. Chin up, 4. Russian Twist, 5. Superman Back Hold, 6. Bronco 1.2 km, 7. 20-meter sprint, 8. Vertical Jump Standing, 9. Vertical Jump Running, 10. Medicine Ball Throw, 11. Average Reaction Speed, 12. Juggling 3 Balls, 13, Ankle flexibility, 14. Upper body flexibility, 15. Sit & Reach Flexibility. However, as time goes by, with more comprehensive developments, updates in research show that each volleyball test directly varies according to race, anthropometry, and individual athlete adjustments. Tessutti et al. (2019) making a volleyball test includes several tests including: 1. Flexibility, 2. Abdominal Strength, 3. Muscle Strength and Endurance, 4. Explosive Power Arms, 5. Counter Movement Jump (CMJ), 6. Agility, Speed. Several motor tests for volleyball athletes include Sit and Reach test items, Sith up, push up, medicine ball throw, countermovement jump, shuttle run, and speed.

Bearing in mind that the standardisation/category provisions that apply specifically to the sport of volleyball have yet to be made available. Paying attention to the research survey results regarding the standardisation of measuring instrument components, it is necessary to develop them from existing ones so that later, the results will be more comprehensive for East Java's male elite volleyball athletes.

METHOD

The type of research carried out in this research is a type of development or Research and Development (R&D), which aims to develop a new product or improve an existing product, (Maksum, 2018). The Likert scale measures the attitudes, opinions, and perceptions of a person or group of people about social phenomena. In this study, a Likert scale was used to measure the suitability of the volleyball physical test items and the coach's perception of the physical test items carried out during physical tests on volleyball athletes. This type of questionnaire is quantitative descriptive, which researchers use in research. Then, the data analysis technique used quantitative descriptive analysis and a Likert scale according to the development procedures. Respondents to this research include material experts and volleyball coaching experts with the International Volleyball Coaching Certificate (FIVB) title. After that, the questionnaire scoring results will be analysed using a Likert scale. The data in this research is quantitative. The data is from the respondents' assessment of physical test item questionnaires by measurement test experts, volleyball material experts, and volleyball measurement test experts. As well as secondary data from the 2020 Papua PON physical test results. The instruments used to collect information are in the form of existing or secondary data previously and developed for further improvement in the form of questionnaires and written questionnaires of secondary data, which will be responded to by experts. Experts select existing test items that will be corrected or eliminated by designing them properly to determine their feasibility. Then, it was developed as a comprehensive physical test item for volleyball. With that, the researcher continued the research according to the needs of the next researcher. The supervisor then validated the instrument in the form of a questionnaire. This instrument validation produces a questionnaire ready to collect research data.

RESULTS

This research discusses the development of standardised physical test items for elite volleyball athletes. The independent variable is the physical test item for volleyball athletes, and the dependent variable is the physical condition test. The variable data was obtained

through a questionnaire. The use of questionnaires as a tool to find the primary data by collecting data about specific support for volleyball athletes.

Table 1. Experts validate the results of physical test items

Flexibility	**Presents**
Sit and reach	100%
Total	**100%**
Speed	**Presents**
10-meter sprint	45%
18x2 sprint	35%
20-meter sprint	30%
Total	**100%**
Explosive Power	**Presents**
Counter Movement Jump	50%
Vertical Jump Standing	20%
Vertical Jump Running	30%
Total	**100%**
Endurance	**Presents**
Multistage Fitness Test (MFT)	60%
Yo-Yo Intermittent Recovery Test	40%
Total	**100%**
Strength Upper Body	**Presents**
Hand Grip	10%
Bench Press	30%
Medicine Ball Throw	40%
Dips	10%
Chin-up	10%
Total	**100%**
Strength Lower Body	**Presents**
Single leg squat right, lift	80%
Russian twist	20%
Total	**100%**
Balance	**Presents**
Standing balance test bosu	40%
Modified Bass Test of Dynamic Balance	30%
Juggling	30%
Total	**100%**
Speed Reaction	**Presents**
Digging Agility Test	100%
Total	**100%**
Coordination	**Presents**
Alternate hand wall tosses test	30%
Strongly disagree	70%
Total	**100%**

Based on the percentage results above, several components and several selected items provide a difference between disagree and strongly agree. Thus, it can be concluded that the

physical test components and physical test items in the sport of volleyball are fewer and more significantly carried out by general needs.

Table 2. Components and items of the men's elite volleyball physical test

Components Test	Indicator	Item Test	Norms	*Reference*
Flexibility	Tests and measurements of flexibility and trunk	*Sit and reach*	25 – 28 Cm	(Gulati et al., 2021)
Speed	Body speed test 10 meter running time results	*10Meter Sprint*	1.92 Menit	(Wang et al., 2023)
Explosive Power	The athlete's ability to make maximum jumps in a short time	*Counter Movement Jump*	47.01 Cm	(Sinovas et al., 2015)
Endurance	Number of levels and shuttles	*Mft*	52.2-55.7 VO_2Max	(Berriel et al., 2022)
Strength Upper Body	The resulting force throws as far as possible	*Medicine Ball Throw*	5-6 Meter	(Saccol et al., 2022)
Strength Lower Body	Maximum leg muscle strength possible	*Single Leg Squat (R & L)*	8 – 12 Body Weigh	(Fathi et al., 2019)
Balance	The result of an athlete's time in maintaining body balance in static conditions	*Standing Balance Test*	1 minute	(Fathi et al., 2019)
Speed reaction	Athletes who can respond from nerves to the muscle system to move quickly and precisely	*Digging Agility Test*	1.72 second	(Ho et al., 2019)

DISCUSSION

A research and development process can be carried out if there is data from needs analysis based on empirical facts found in the field. Research and development of a talent test model for prospective basketball athletes use a procedural descriptive model, where the test outlines the steps for carrying out research and development that must be carried out in stages and sequentially to produce a product that is ready to use. The most essential stage that must be carried out to design a test model is problem conceptualisation. Furthermore, if the conceptualisation of the problem has been carried out, then product design development can be done immediately. Next, if product design development is complete, the testing phase can begin immediately in several trial stages. These steps are used to develop a model in the hope of obtaining a valid and reliable test instrument, namely by involving the role of experts (expert judgment) in the field of basketball and sports tests and measurements.

CONCLUSION

From various reviews of problems and discussions referring to several references, researchers can draw several conclusions, namely: standardisation of physical test items for

elite men's volleyball athletes from the East Java team is sufficient; this can be seen from the test items carried out by the relevant references. Moreover, several instruments can be added to complete some of the required physical test item specifications. Such as CMJ (Counter et al.), 10 Meter Sprint, Standing Balance, and Digging Agility Test. The need to develop instruments for physical tests in the sport of volleyball is proven by several tests that have yet to be carried out to measure ability in one of the physical aspects. This is due to the novelty of several experts who stated that the more complex the physical test items tested, the easier it is for us to improve or improve the physical test skills required in volleyball.

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