Research in Physical Education, Sport and Health
2024, Vol. 13, No. 2, pp.97-100
ISSN(Print):1857-8152; ISSN(Online):1857-8160

DIFFERENCES IN THE PRECISION OF PERFORMANCE OF THE TECHNICAL ELEMENT SERVE IN VOLLEYBALL PLAYERS OF DIFFERENT AGES

DOI:
(Original scientific paper)

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Abstract

This study investigates differences in the precision of performing the technical element of the serve between younger (15-17 years) and older (18-19 years) male volleyball players. Precision, as a key motor skill in volleyball, significantly influences overall performance, particularly in serving, which is both a starting and attacking element of the game The study included 60 male volleyball players divided into two age groups. Three tests were employed to measure serving precision: tactical serving (school and tennis serve) and powerful serving. Each test was conducted under standardized conditions, with performance evaluated based on a scoring system. Statistical analysis was performed using SPSS 23, employing descriptive statistics and independent t-tests to examine differences between the groups The findings revealed statistically significant differences in all tests between younger and older players. Older players demonstrated superior precision in tactical serving (school: M = 17.13, SD = 1.82; tennis: M = 18.34, SD = 2.27) and powerful serving (M = 17.23, SD = 2.71) compared to their younger counterparts (school: M = 15.66, SD = 2.71; tennis: M = 16.06, SD = 2.22; powerful: M = 11.80, SD = 2.48). The strongest differences were observed in the powerful serve test. Older volleyball players displayed higher precision across all serving tests, highlighting the impact of age and experience on motor skills development. These results underscore the importance of targeted training programs to enhance precision in younger players, thus improving their overall volleyball performance.

Key words: *precision, volleyball, technical skills, motor development, age differences*

Introduction

Volleyball, during its development, has been improved and perfected through all its segments. The modern way of playing requires a perfect mastery of the elements of technique (the most rational and precise execution of movements in order to solve certain tasks). In order for volleyball players to reach the stage of providing maximum results, they must go through a certain transformational processes. The dominant place in volleyball is occupied by specific motor skills, that is, the technique that the player needs to do before contact with the ball, as well as in the game itself.

The element of volleyball technique that starts the game is the serve. Service is one of the elements of attack and, one could say, it is one of the most effective elements of attack. It is the only element of the game that the players have to perform, when they come to "zone 1" according to the order of rotation. It is a specific circumstance and a big responsibility, which at a given moment cannot be transferred to other players.

By changing the rules of the volleyball game (the possibility of serving along the entire length of the baseline), conditions were created for improving and upgrading the serve as one of the basic elements of the attack in volleyball. As the first element of the attack, the serve should be performed in such a way that the opponent is prevented from receiving a good reception (the most ideal is to win points directly), and therefore the organization of a quick and efficient attack.

In order for the player to be able to perform the service as a "conditional reflex action", training is required, which consists of a large number of consecutive repetitions of the service at each training session.

Repetition of the service should be performed in series, and the schedule of the series is measured according to the capabilities of the server, so that it does not cause excessive fatigue (fatigue has a negative effect on the "adoption" of motor ways).

The success of serving also depends on certain actions of the player: to determine the place from which to serve, to choose the appropriate technique of serving, to choose the target to aim for.

The serving variants (taking into account the position of the server in relation to the net) are as follows:

a) Frontal - server facing the direction of serving:

1. Lower service (school)
2. Tennis service
3. Upper wobbly serve
4. Jump service

b) Sagittal - the server turned laterally towards the direction of serving:

1. Side serve with rotation
2. Side swinging serve (Tomić and Nejić, 2004).

Accuracy is the ability to effectively hit an external object with a guided and/or launched projectile (Sekulić and Metikoš, 2007).

Based on the phenomenological approach and knowledge, precision can be divided into:

• accuracy of shooting - throwing projectiles along a certain curve with the aim of hitting targets;

• targeting accuracy - the ability to hit a target by guiding the projectile to the launch target.

In several sports, e.g. in volleyball, the precision of aiming and shooting is manifested at the same time. The volleyball player first hits the ball with his hand, and then shoots the desired part of the field with that ball.

A good kinesthetic sense of the target, a good assessment of spatial parameters, kinesthetic control of movement and concentration time are very important for precision. Performing precise movements is based on the control of visual and kinesthetic information. For optimal precision, it is necessary to meet certain prerequisites, namely the perception of space and the localization of the target.

Accuracy depends on the center for perception and its connection with the reticular system and represents a sensitive motor dimension, because the results also vary from the emotional state in which the person is (Kurelić, Momirović, Stojanović, Šturm, Radojević and Viskić, 1975).

Method

The study involved 60 male respondents, divided into two age groups. The first group consisted of respondents aged 15 to 17 years, and the second group of respondents aged 17 and up to 19 years. The measurements were conducted in the club "VGSK" in Veliko Gradiste. A battery of tests was used that were designed to determine the motor ability, the precision of performing the technical element serve: 1) Precision of tactical serving - School service 2) Precision of tactical serving - Tennis service 3) Precision of strong serving. *Precision of tactical serving - school service*, Instruments: volleyball court and volleyball balls. Assignment: The field on one side of the playing field is divided by lines into six equal parts (player position zones). The examinee performs 12 school serves from the serving area, always shooting into the second zone in the following order: 6, 2, 4, 1, 3, 5, and again in the same order. The task was repeated 3 times. The best value was taken. Rating: A hit in the target zone brings 2 points, and if it hits the zone that is on its side, 1 point, the rest 0 points. *Precision of tactical serving - tennis service*, Instruments: volleyball court and volleyball balls. Assignment: The field on one side of the playing field is divided by lines into six equal parts (player position zones). The examinee performs 12 tennis serves from the serving area, always hitting the second zone in the following order: 6, 2, 4, 1, 3, 5, and again in the same order. The task was repeated 3 times. The best value was taken. Rating: A hit in the target zone earns 2 points, and if the respondent hits a zone that is adjacent to the target zone - 1 point; other - 0 points. *Precision of powerful serving,* Instruments: volleyball court and volleyball balls Assignment: The field on one side of the playing field is divided by longitudinal lines into three equal fields. From the serving area, the subject executes 12 upper serves with full swing, hitting each segment in the marked order, ie. 1, 2 and 3, and again three more times. The task was repeated 3 times. The best value was taken. Rating: A hit in the right square brings 2 points, and if it hits in a square that is on the side of the target - 1 point; other - 0 points.

The SPSS program (IBM SPSS Statistics 23) was used for detailed statistical analysis. The arithmetic mean (Mean) and standard deviation (Std.) Are shown for the dependent variable included in this study,

and the range of minimum and maximum. The difference between the arithmetic means of the two groups (older and younger) was determined using a parametric test (T - test for independent samples).

Results and discussion

This section presents descriptive statistics for the serve accuracy variable, which is measured through three tests, representing: tactical serve accuracy - school serve, tactical serve accuracy - tennis serve, and strong serve accuracy. Given that each subject had three attempts for each test, the average values of the results achieved on each test for each subject were taken.

Table 1. Descriptive Statistics - Serving Accuracy

Dependent variable	Test name	Min.	Max.	M[a]	SD[b]
Serving accuracy	tactical serve accuracy - school serve	10.67	21.33	16.39	2.40
	tactical serve accuracy - tennis serve	11.67	22.33	17.20	2.51
	strong serve accuracy	8.00	22.33	14.52	3.76

[a] – Average (arithmetic mean)
[b] – Standard deviation

The data from Table 1. show that on the test that measures the precision of tactical serving - the school serve, the lowest achieved value is 10.67, while the maximum value is 21.33. The average score on this test per subject is 16.39 (SD = 2.40).

When it comes to precision of tactical serving - tennis serve, the minimum value achieved on this test is 11.67, the maximum result is 22.33, while the average result for the entire research sample is 17.20 (SD = 2.51).

Based on the results in Table 4, we note that the minimum value for the accuracy test of the strong serve is 8.00, and the maximum result is 22.33. The average value per subject on this test is 14.52 (SD = 3.76).

Table 2. Differences between older and younger groups of respondents in relation to serving accuracy

	Descriptive statistics					T - test		
Name of the test	Age	N[a]	M[b]	SD[v]	SE_M[g]	T[d]	Df[dj]	p[e]
Tactical serve accuracy - school serve	Younger group	30	15.66	2.71	.49	2.483	50.711	.02*
	Older group	30	17.13	1.82	.33			
tactical serve accuracy - tennis serve	Younger group	30	16.06	2.22	.41	3.941	58	.00**
	Older group	30	18.34	2.27	.41			
strong serve accuracy	Younger group	30	11.80	2.48	.45	8.111	58	.00**
	Older group	30	17.23	2.71	.49			

[a] –Number of respondents
[b] –Average (arithmetic mean)
[v] –Standard deviation
[g] –Standard error of the difference
[d] –The value of the t-statistic
[dj] –Number of degrees of freedom
[e] – Level of significance (p>.05 there is no statistically significant difference; *p<.05 there is a statistically significant difference - milder criterion; **p<.01 there is a statistically significant difference - stricter criterion).

The obtained data in Table 2. indicate that there is a statistically significant difference between the older and younger groups of respondents when it comes to all three tests. Test results Precision of tactical serving - School service (t = -2.483, df = 50.711 p <, 02*). Precision of tactical serving - Tennis service (t = -3.941, df = 58.00 p <.00**). Precision of strong serving (t = -8.111, df = 58.00 p <.00*). It is also noticed that the biggest difference is between the older (M = 17.23, SD = 2.48, SEM = .41) and younger group (M = 15.66, SD = 2.71, SEM = .49) of the respondents in relation to the results of the strong serving precision test.

The problem of precision has been investigated by many authors. Their knowledge mainly covered the area of the structure of volleyball players and solving motor tasks in situational training or volleyball

competition (Bernstein, 1990; Gajić, 2005; Karalić, 2007; Lâhova and Strelnikova, 2007; Nemcev, 2003; Nešić , 2006; Milenkoski, 2005). In most of the works, the problems of only some parts of the structure of the game are solved or factors that are directly or indirectly related to the structure of the competitive activity are considered. One of the significant issues that pervades the research carried out so far is the issue of reliability and validity of tests for situational-motor precision and situational-motor tests in volleyball. In the manifest and latent anthropomotor area, precision is defined as a special volleyball ability. In the latent area of motor skills, two types of motor precision are distinguished: accuracy by shooting and precision by aiming (Stojiljković, 2003). Volleyball is characterized by shooting accuracy. If we are already talking about the types of volleyball precision, let's add that they stand out: precision of reception, spike, block, service and dig. Therefore, it appears as an integral part of all tactical and technical elements (reception, spike, block, service and dig).

Previous research has mainly refered the effects of training on the accuracy of volleyball (Krističević, Madić & Krakan, 2016, Delektrat & Martinez, 2014). This research provides new information on the differences between younger and older categories.

Conclusion

The main goal of this research was to determine a statistically significant difference in the precision of performing the technical element of the serve between younger and older volleyball players. It was confirmed that the volleyball players of the older age group were more successful in the applied tests for precision. Precision is one of the key motor skills, on which the success of a volleyball player will largely depend.

Key words: technique, cadets, juniors.

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