INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 07 Issue 01 January 2024

DOI: 10.47191/ijmra/v7-i01-18, Impact Factor: 7.022

Page No. 127-133

Analysis of the Dominant Aspects of Libero's Basic Skills

Taufiq Hidayat[1], Gigih Siantoro[2], Sri Wicahyani[3]

[1,2,3] Universitas Negeri Surabaya, Surabaya, Indonesia

ABSTRACT: The physical fitness parameters of players in the libero position need to be measured to maintain performance with training that is appropriate to the needs of supporting movement performance as a libero. The aim of this research is to analyze the basic skills of Libero players. This is quantitative research that uses skill tests as a research instrument. The test instruments used include grip strength tests, sit-and-reach, running, push-up, sit-up, back-up, and vertical jumps. The research population is volleyball players in the position of libero in the Volleyball Student Activity Unit at Surabaya State University. The sampling technique used was a total sampling of 12 students. The data was analyzed descriptively and quantitatively to determine the average skill characteristics of Libero players. The research results show that the average sit and reach test measurement result for male players is 37.93 and for female players is 40.70. The average left-hand grip strength test result for men is 39.43 and for women is 26.8. The average right-hand grip strength test result for men is 41.29 and for women is 28.40. The average result of the push-up test for men is 34.29, and for women, it is 38.80. The average result of the sit-up test for male players is 44.14, and for females, it is 54.00. The average back-up test result for male players is 76.00, and for women, it is 76.00. The average running test result for men is 9.81 and for women is 9.64. The average result of the vertical jump test for men is 55.14 cm, and for women, it is 48.80 cm. The results of this research are useful for trainers as a consideration in preparing special physical training programs that suit the characteristics of liberos.

KEYWORDS: exercise, libero, basic skills

INTRODUCTION

Player performance in a competition is influenced by many factors, both technical and tactical (Martínez et al., 2023). In order for players to show a high level of performance, training plans must be prepared according to the player's needs and followed by individual athletes (Altundağ, 2021). Player performance is a unity between aspects of skill quality and physical and psychological quality. Good mastery of basic skills, supported by the player's physical qualities, will produce the player's best performance when competing. Meanwhile, good mastery of basic skills, good physical quality, and good psychology will also be able to maintain the consistency of the player's game when competing. It is important for a trainer to have continuous data regarding these three aspects to develop training programs, both short-term and long-term.Evaluation in sports is fundamental to the training process of every athlete on a team and is a very necessary support for coaches (D'Isanto et al., 2019). In an effort to achieve optimal sports performance, monitoring, predicting, and improving sports performance are important elements that must be considered by a coach (Slovák et al., 2023). The coach will arrange the player's technical, tactical, and physical training according to the character of the player's individual position.Volleyball matches consist of various techniques for applying special volleyball skills, namely serving, receiving, sets, attacks, blocks, and defense (Inkinen et al., 2014). The motor characteristics of players in certain positions will be different from those in other positions. Players at various positions differed significantly in terms of height and all three somatotype components, but no significant differences were found in body mass, body mass index, or any of the physical performance variables measured. Players with different performance levels differed significantly in both anthropometric variables and physical performance. Generally, middle blockers are taller, more ectomorphic, less mesomorphic, and endomorphic, while liberos are shorter, less ectomorphic, more mesomorphic, and endomorphic than other position players. Players who were more successful in all positions had lower body mass indexes, were less mesomorphic and endomorphic, and were more ectomorphic than less successful players. More successful players demonstrate better lower body strength, speed, agility, and upper body strength (Milić et al., 2017). Anthropometric profile and motor skills are the dominant factors that influence the performance of volleyball players (Mielgo-Ayuso et al., 2015; Nasuka, 2020). The important skills possessed by a volleyball player are supported by basic movement skills, or motor skills. Volleyball is a net sport that involves the realization of fast and explosive movements. The

demands of the game require players to have a high level of strength, physical fitness, and technical skills. Outside hitters are players who play on the left side of the net and in the middle of the back row of the court and specialize in receiving and attacking. Middle blockers are players who play in the middle of the back row, where their role is replaced by the libero player. Opposite is a player who specializes in spikes from the front row or at the back. Setters are players who play on the left side of the net and back row and have specific tasks in attack settings (Medeiros et al., 2014).

Libero plays an important role in the team's defense from opponent attacks. The role of the libero is very special compared to other players thanks to his ability to act as the team's main defender when playing (Marra et al., 2019). The libero has the dominant task of fighting to be able to receive the ball when there is a ball attack from the opponent and directing the setter to carry out the attack (Yumi et al., 2022). The libero position is used to maximize defensive capabilities and ball reception, allowing the team to remain competitive in matches by increasing the chances of gaining points through good attacks. The parameters of whether a libero is good or not can be seen from the ability to receive serves both at the bottom and top and in defense (Sujarwo & Purnomo, 2020).

The libero's skills are so important nowadays that even a club can officially play two liberos in a game. Apart from that, the libero's skills also have an impact on the level of confidence of other players in playing the game. However, libero is still not the main choice for prospective players compared to spiker and tosser. In fact, the selection of Libero seems to be the last choice for those who are not included in the spiker or setter player plot. So the selection system used to select a libero is considered not selective according to the skill requirements, which are proven to be very high. The physical fitness parameters of libero players also need to be measured to maintain performance with training that suits the needs of supporting movement performance as a libero.

METHOD

This is quantitative research that uses skill tests as a research instrument. The test instruments used include the grip strength test, sit and reach, running, push up, sit up, back up, and vertical jump.

The research population is volleyball players in the position of libero in the Volleyball Student Activity Unit at Surabaya State University. The sampling technique used was a total sampling of 12 students who were members of the Volleyball Student Activity Unit at Surabaya State University in the libero position.

The research procedure begins with field observations; namely, the researcher analyzes the skills of volleyball players, especially liberos. Next, the researcher looked for references and literature studies related to libero skills. The researcher designed a skills test as a research instrument. Researchers collected data using skills tests on the sample. Researchers collect data and then analyze it.

Table 1. Categorization of Research Results

No	Category	Criteria
1	Low	X<M-1SD
2	Medium	M-1SD ≤X ≤M +1SD
3	Hight	X>M+1SD

Data is analyzed quantitatively and descriptively, namely by a method that helps to describe and summarize data in a constructive way, referring to statistical descriptions to help understand the details of the data. Next, the data is presented descriptively, and the average skill characteristics of the Libero players can be seen.

RESULT AND DISCUSSION

Data on the age, weight, height, and body mass index of the sample are as follows:

Code	Sex	Age	Height	Weight	BMI
X1	L	19	168	64	22.68
X2	L	19	165	55	20.20
X3	L	18	166	51	18.51
X4	L	18	173	63	21.05
X5	L	21	163	60	22.58
X6	L	23	163	59	22.21
X7	L	20	150	56	24.89
X8	P	22	155	55	22.89
X9	P	18	164	68	25.28

X10	P	19	160	50	19.53
X11	P	18	150	56	24.89
X12	P	19	163	50	18.82

The results of measuring sample flexibility with the sit-and-reach test are as follows:

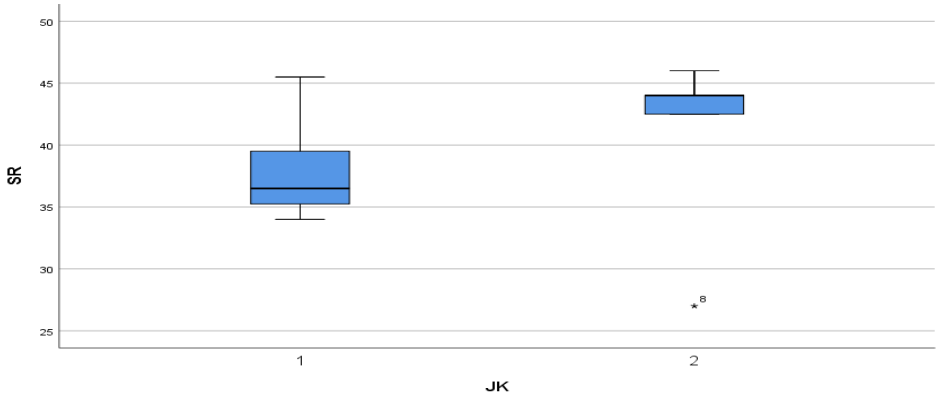

Figure 1. Sit and Reach Plot

The average sit-and-reach measurement result for male players is 37.93 with a standard deviation. The deviation is 4.344, and the average measurement result for female players is 40.70 with standard. Deviation 7,759. The average sit-and-reach test measurement result for women (2) is better than the average sit-and-reach test measurement result for men (1).

Table 2. ***Sit and Reach Test Category***

No	Category	Formula	Male	Female
1	Low	X<M-1SD	X < 33.586	X<32.941
2	Medium	M-1SD ≤X ≤M +1SD	33.586 ≤X ≤42.274	32.941≤X ≤48.459
3	Hight	X>M+1SD	X > 42.274	X > 48.459

Sit and reach test results are measured in centimeters or inches. Positive values indicate the extent to which a person can reach or exceed the reference point on the measuring device. A negative value indicates the extent to which a person has not reached the reference point, which means there is no movement of the body curve at all from the initial position, namely sitting with the body upright and both legs straight forward. Flexibility in some joints can be increased to a certain degree through exercise. Exercises are performed with stretching as a common exercise component to maintain or improve flexibility. A player's perfection in skill and technique is highly dependent on effective training methods and several appropriate exercises for the development of general strength and power, flexibility, coordination, and agility for optimal performance (Aslam, 2017).

The results of measuring hand strength using the grip strength test are as follows:

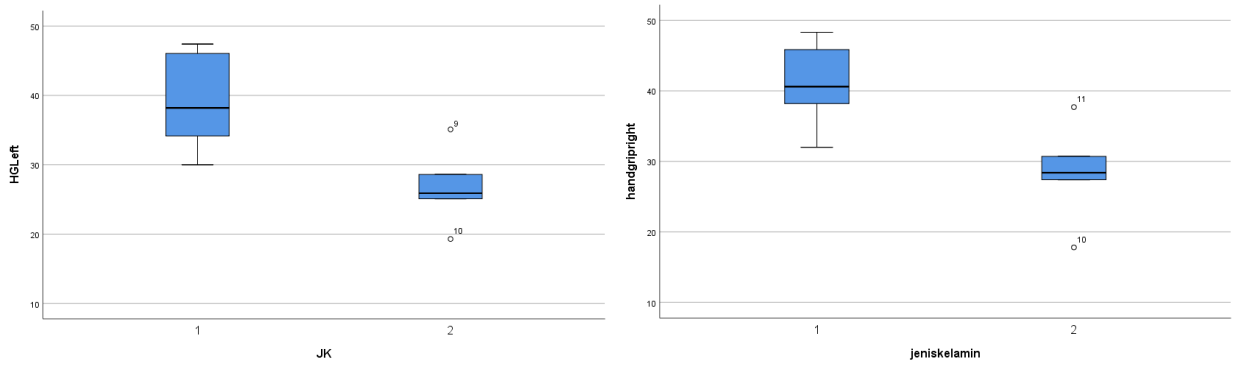

Figure 2. Grip Strengh Test Plots

The average left-hand grip strength test result for male players is 39.43 with a standard deviation of 7.342, while for female players it is 26.80 with a standard deviation. Deviation 5,746. The average grip strength test result for the right hand of male players is 41.29 with a standard deviation of 5.961, while for female players it is 28.40 with a standard deviation of 7.161.

Table 2. Grip Strength Test Categories

No	Category	Formula	Male		Female	
			Right hand	Left hand	Right hand	Left hand
1	Low	X<M-1SD	X < 35.329	X < 32.088	X< 21.239	X < 21.054
2	Medium	M-1SD ≤X ≤ M +1SD	35.329 ≤X ≤ 47.251	32.088 ≤X ≤ 46.772	21.239 ≤X ≤35.561	21.054 ≤X ≤ 32.546
3	Hight	X>M+1SD	X > 47.251	X > 46.772	X > 35.561	X > 32.546

Grip Strength Test results are measured in weight units. Higher values indicate better grip strength. The grip strength test score can provide information about the muscle strength of the hands, wrists, and upper arms. Test results can be used to monitor changes in physical strength over time as a result of the exercise performed. Volleyball players predominantly hit the ball with high speed and a long range of motion (Tooth et al., 2023). Hand strength is one of the determinants of whether the ball is hit fast, hard, or not.

The results of measuring abdominal muscle strength using push-up, sit-up, and back-up tests are as follows:

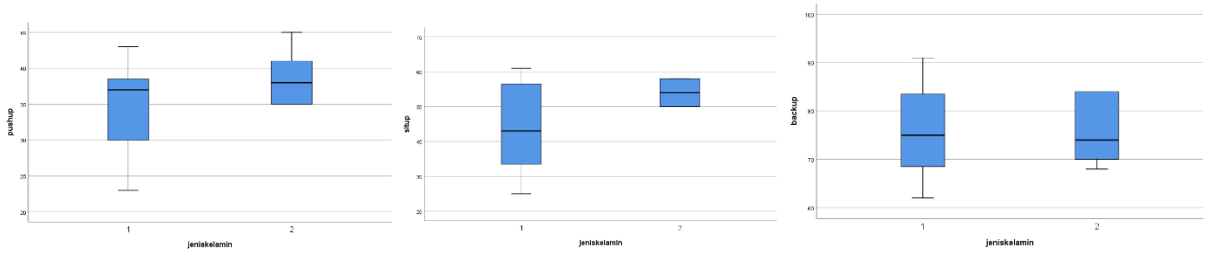

Figure 3. Push Up, Sit Up and Back Up Test

The average result of the push-up test for male players is 34.29 with standard The deviation is 6.969, while the average push-up test for women is 38.80 with the standard. Deviation 4,266. The average result of the sit-up test for male players is 44.14 with standard Deviation is 14.334 while the average sit-up test for women is 54.00 with standard. Deviation 4,000. The average back-up test result for male players is 76.00 with a standard deviation of 10.708, while the average back-up test for women is 76.00 with a standard deviation of 7,616.

Table 3. Categories Of Push-Up, Sit-Up, And Back-Up Tests

No	Category	Formula	Male			Female		
			Push-Up	Sit-Up	Back-Up	Push-Up	Sit-Up	Back-Up
1	Low	X<M-1SD	X < 27.321	X < 29.806	X < 65.292	X< 34.534	X < 50.00	X < 68.384
2	Medium	M-1SD ≤X ≤M +1SD	27.321 ≤X ≤41.259	29.806 ≤X ≤ 58.474	65.292 ≤X ≤86.708	34.534 ≤X ≤ 43.066	50.00 ≤X ≤ 54.00	68.384 ≤X ≤ 83.616
3	Hight	X>M+1SD	X > 41.259	X > 58.474	X > 86.708	X > 43.066	X > 54.00	X > 83.616

The results of the push-up, sit-up, and back-up tests can provide an overview of strength, endurance, and physical fitness.

The results of the running test measurements are as follows:

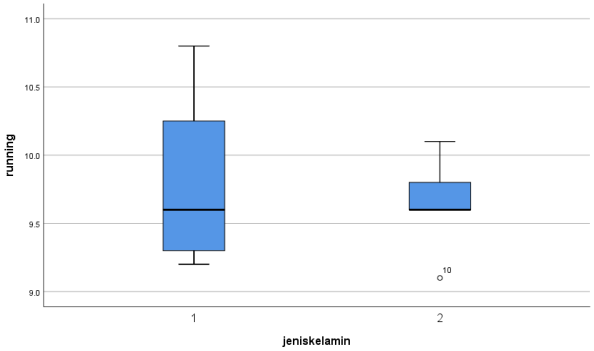

Figure 4. Running Test

The average running test result for male players is 9.81 seconds with a standard deviation of 0.672, while the average running test result for women is 9.64 seconds with a standard deviation of 0.365.

Table 4. Run Test Categories

No	Category	Formula	Male	Female
1	Low	X<M+1SD	X < 10.482	X > 10.005
2	Medium	M-1SD ≤X ≤ M +1SD	10.482 ≤X ≤ 9.138	9.275 ≤X ≤ 10.005
3	Hight	X>M-1SD	X > 9.138	X<9.275

It is important to build physical performance in terms of strength, speed, endurance, flexibility, neurological abilities, and more. Agility plays an important role in many types of sports, including volleyball. This means that volleyball players need to focus on improving agility. Agility training can be done in various ways (Junpalee et al., 2023). Coaches need to monitor agility levels and have data periodically (Paška et al., 2023).

The results of the vertical jump test measurements are as follows:

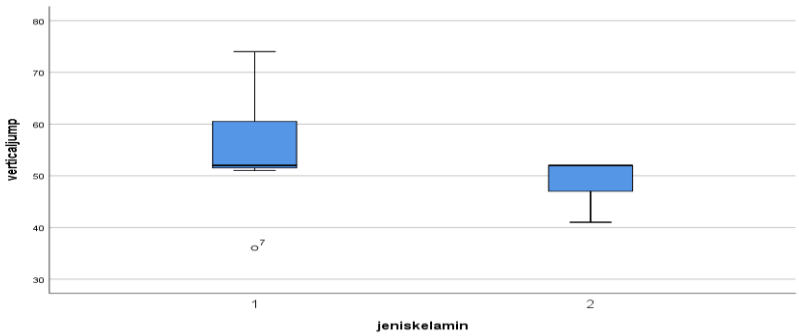

Figure 3. Vertical Jump Test

The average result of the vertical jump test for male players is 55.14 cm, with a standard deviation of 11.697 cm, while the average vertical jump test for women is 48.80 cm, with a standard deviation of 4,868 cm.

Table 4. Vertical Jump Test Categories

No	Category	Criteria	Laki-Laki	Perempuan
1	Low	X<M-1SD	X <43.443	X< 43.932
2	Medium	M-1SD ≤X ≤M +1SD	43.443≤X ≤ 66.837	43.932 ≤X ≤ 53.668
3	Hight	X>M+1SD	X > 66.837	X > 53.668

The standing vertical jump test is a test used to measure a person's ability to jump vertically from a standing position. This test is used to assess leg muscle strength and explosive power in the lower leg muscles. Volleyball is characterized as a ball game that requires biomechanical demands on the musculoskeletal system as well as a lot of neuromuscular coordination, speed, agility, and strength. Passing, setting, spiking, blocking, and serving the ball are basic movements in the game of volleyball that require the implementation of various vertical or horizontal jumps, as well as speed actions (Agopyan et al., 2018). The vertical high jump is considered an important criterion that influences the overall performance of volleyball players (Akalan et al., 2022; Bartol et al., 2022).

As a libero, horizontal jumps are predominantly used to hunt or chase an opponent's attack ball, which can slide in an uncertain direction.The libero must have excellent ball-receiving skills. They are not required to be tall and strong, but they need more experience in reading the game correctly as a basis for decision-making, which is supported by aspects of agility for the execution of decisions that have been taken (Palao et al., 2014). Libero has unique characteristics compared to other players in terms of anthropometry. The libero does not show certain characteristics, but in terms of physical characteristics, the libero must have speed, agility, flexibility, and body composition. The libero must receive the pass first and also defend the opponent's attacks from all directions and the uncertain speed of the ball. For this reason, the libero must be in a low stance. Short players such as liberos need less time to take a low-standing position than other players; in other words, short liberos have an advantage in this regard (Malla & Singh, 2022).

CONCLUTION

The research results show that the average sit and reach test measurement result for male players is 37.93 and for female players is 40.70. The average left-hand grip strength test result for men is 39.43 and for women is 26.8. The average grip strength test

result for men's right hand is 41.29, and for women, it is 28.40. The average result of the push-up test for men is 34.29, and for women, it is 38.80. The average result of the sit-up test for male players is 44.14, and for females, it is 54.00. The average back-up test result for male players is 76.00, and for women, it is 76.00. The average running test result for men is 9.81 and for women is 9.64. The average result of the vertical jump test for men is 55.14 cm, and for women, it is 48.80 cm. The results of this research are useful for trainers as a consideration in preparing special physical training programs that suit the characteristics of liberos.

Liberos need to have a responsive nervous system to respond quickly to changes in the direction of the ball. Speed and agility in movement are essential to enable them to be in the right position to make a reception or dig in on the ball. A good cardiorespiratory condition is essential because liberos are often involved in intense defense and moving quickly across the court. Muscle strength and endurance, especially in the leg and core muscles, are needed to support rapid and frequent movements and to withstand the physical stress of defense. Good balance and coordination help liberos maintain their body stability when performing complex movements, such as diving or moving laterally to dig into a low ball. Good flexibility in the major joints, especially in the hip and shoulder areas, can improve the libero's ability to reach the ball with optimal body posture. Liberos need to have a high level of sensory sensitivity to be able to anticipate the movement of the ball and decide on the right response in a short time.

REFERENCES

1) Agopyan, A., Ozbar, N., & Ozdemir, S. N. (2018). Effects of 8-Week Thera-Band Training on Spike Speed, Jump Height and Speed of Upper Limb Performance of Young Female Volleyball Players. *International Journal of Applied Exercise Physiology*, *7*(1), 63–76. https://doi.org/10.22631/ijaep.v7i1.218
2) Akalan, N. E., Gece, E., Yıldız, M., Akel, B. S., Kuchimov, S., Önerge, K., & Evrendilek, H. (2022). The effect of flexible pes planus on lower extremity kinematics during vertical high jump in volleyball players. *Gait & Posture*, *97*, S299–S300. https://doi.org/10.1016/j.gaitpost.2022.07.178
3) Altundağ, E. et al. (2021). Tracking External Training Loads in Volleyball in Terms of Player Positions. *Turkish Studies-Social Sciences*, *Volume 16*(Volume 16 Issue 3), 921–932. https://doi.org/10.47356/turkishstudies.49992
4) Aslam, K. M. (2017). Effect On Flexibility Of Volleyball Players By Some Selected Exercises. *European Journal of Physical Education and Sport Science*, *3*(5), 141–151. https://doi.org/https://zenodo.org/doi/10.5281/zenodo.1291336
5) Bartol, V., Vauhnik, R., & Rugelj, D. (2022). Influence of the sport specific training background on the symmetry of the single legged vertical counter movement jump among female ballet dancers and volleyball players. *Heliyon*, *8*(9), e10669. https://doi.org/10.1016/j.heliyon.2022.e10669
6) D'Isanto, T., D'Elia, F., Raiola, G., & Altavilla, G. (2019). Assessment of sport performance: Theoretical aspects and practical indications. *Sport Mont*, *17*(1), 79–82. https://doi.org/10.26773/smj.190214
7) Inkinen, V., Häyrinen, M., & Linnamo, V. (2014). Technical and tactical analysis of women's volleyball. *Biomedical Human Kinetics*, *5*(1), 43–50. https://doi.org/10.2478/bhk-2013-0007
8) Junpalee, P., Singchainara, J., & Butcharoen, S. (2023). Effects of the intelligence innovative smart ladder drill training program on developing agility of female youth volleyball players at Sriracha School. *Journal of Physical Education and Sport*, *23*(4), 1025–1035. https://doi.org/10.7752/jpes.2023.04128
9) Malla, B. A., & Singh, D. (2022). *Anthropomorphic and physical parameters of volleyball players at different positions : A study*. *9*(1), 368–372.
10) Marra, F., Aquino, M., & Altavilla, G. (2019). Longitudinal case study of the role of libero in volleyball. *Journal of Human Sport and Exercise*, *14*(Proc4), S1112–S1121. https://doi.org/10.14198/jhse.2019.14.Proc4.75
11) Martínez, E. L., García, G. M. G., & Molina-Martín, J. J. (2023). Quantification of the competition load of the sets in high-level volleyball in the year 2021. *Journal of Physical Education and Sport*, *23*(1), 134–142. https://doi.org/10.7752/jpes.2023.01017
12) Medeiros, A. I. A., Palao, J. M., Marcelino, R., & Mesquita, I. (2014). Systematic review on sports performance in beach volleyball from match analysis. *Revista Brasileira de Cineantropometria e Desempenho Humano*, *April 2013*, 698–708. https://doi.org/http://dx.doi.org/10.5007/1980-0037.2014v16n6p698
13) Mielgo-Ayuso, J., Calleja-González, J., Clemente-Suárez, V. J., & Zourdos, M. C. (2015). Influencia de la composiciÓn corporal en el rendimiento fÍsico de jugadoras de voleibol en funciÓn de su posiciÓn de juego. *Nutricion Hospitalaria*, *31*(2), 849–857. https://doi.org/10.3305/nh.2015.31.2.7658
14) Milić, M., Grgantov, Z., Chamari, K., Ardigò, L. P., Bianco, A., & Padulo, J. (2017). Anthropometric and physical characteristics allow differentiation of young female volleyball players according to playing position and level of expertise. *Biology of Sport*, *34*(1), 19–26. https://doi.org/10.5114/biolsport.2017.63382

15) Nasuka, N. (2020). *The Anthropometric Profile and Motor Skill of Men Elite Volleyball Players*. *21*(Icsshpe 2019), 34–37. https://doi.org/10.2991/ahsr.k.200214.010
16) Palao, J. M., Manzanares, P., & Valadés, D. (2014). Anthropometric, physical, and age differences by the player position and the performance level in volleyball. *Journal of Human Kinetics*, *44*(1), 223–236. https://doi.org/10.2478/hukin-2014-0128
17) Paška, Ľ., Horička, P., Šimonek, J., Czakova, N., & Poláčková, L. (2023). *Examining the interplay between reactive and planned agility with motor and anthropometric parameters in female volleyball players*. *23*(10), 2737–2743. https://doi.org/10.7752/jpes.2023.10313
18) Slovák, L., Sarvestan, J., Alaei, F., & Zahradník, D. (2023). Predicting the volleyball spike jump height by the force-time curve variables of countermovement and volleyball spike jump. *Journal of Physical Education and Sport*, *23*(2), 424–430. https://doi.org/10.7752/jpes.2023.02052
19) Sujarwo, S., & Purnomo, A. (2020). Kontribusi Recive Servis, Dig, Cover dan Toss Pemain Libero dalam Pertandingan Final SEA GAMES 2019. *Media Ilmu Keolahragaan Indonesia*, *10*(1), 1–5. https://doi.org/10.15294/miki.v10i1.23945
20) Tooth, C., Schwartz, C., Gofflot, A., Bornheim, S., Croisier, J. L., & Forthomme, B. (2023). Preseason shoulder screening in volleyball players: is there any change during season? *JSES International*, *7*(4), 662–667. https://doi.org/10.1016/j.jseint.2023.03.022
21) Yumi, O., Suzune, F., & Shinichi, D. (2022). *Anthropometric profile and physical fitness characteristics in the difference of position of Japanese female high-school volleyball players*. *6*(1). https://doi.org/https://doi.org/10.30472/aesj.v6i1.277

There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (https://creativecommons.org/licenses/by-nc/4.0/), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.