

Assessment of Physical Components in Young Boys' Volleyball Players

Dr. Artan Pogoni¹, Prof. Assoc. Enkeleida Lleshi²

¹Department of Physical Education and Sports, ²Department of Sports Performance,

¹Faculty of Social Sciences, Tourism and Sports, "Barleti" University, Albania

²Sports Research Institute, Sports University of Tirana, Albania

Corresponding Author: Enkeleida Lleshi enlleshi@yahoo.com

<https://doi.org/10.63711/ijdr.net20250101>

ABSTRACT

In collective sports such as volleyball, football, basketball among other technical elements that these kinds of sports contain parameters of other physical abilities are also required. The aim of this study was to find out the trend of improvement and differences in the age of anthropometric and physical abilities of boys who practice the sport of volleyball in Albania. Methods: Participants in this study were (N=120) volleyball players from three age categories as follows; 12-14 yrs. N=40, 14-16 yrs. N=40, and 16-18 yrs. N=40. Measurement for Body Weight (BW), Body Height (BH) and waist circumference. Physical abilities; push up test, curl-up test, standing long jump and vertical jump test. Results: Results from ANOVA analysis between three age categories show significant differences. Data of this study for jumping performance using vertical jump CMJ test between groups show (mean difference= 16.7 cm; Sig= 0.026). Data show (mean difference= 21.3 cm; Sig= 0.004) while for vertical jump Run up test between groups. Conclusion: Final results show a statistical increase between age categories for body weight, height and stranding long jump, vertical jump (CMJ and run-up) while for the other measurement of physical fitness components no significant improvement was to be found mostly in boys volleyball players with regard to age groups.

Keywords: boys, physical abilities, volleyball, anthropometric.

INTRODUCTION

Team games require a comprehensive preparation of skills such as technical, tactical, physical and mental or psychological aspects. These skills are of particular importance to every player who plays but specifically, physical skills play a crucial role and affect the intelligence and tactics of the game because during these games a high physical performance is required. Volleyball is characterized by continuous jumps combined with blocks and spikes, numerous short-distance sprints as well as short agility movements that occur repeatedly throughout the match or training session (Viitasalo et al., 1987). The performance of these precise and structured movements depends on anthropometric parameters and physical abilities (Thissen-Milde and Mayhew, 1991). Physical condition is the degree of state of a person's body, be it in prime condition or not (Subekti et al., 2021). Therefore, volleyball players need to be in top physical condition to handle the physical demands of playing at a high level of competition. For this reason, players need to focus a lot to improve their physical capacity (aerobic and anaerobic) in order to have a high performance in the game, fast and long-term movements throughout the game both in offense and defence.

As a consequence, in youth ball sports, later-born and less mature players are strongly underrepresented, especially at the elite level (Hill B and Sotieiadou, 2016). This phenomenon is a well-documented selection bias and is known as the relative age effect (Musch and Grondin 2001). Nevertheless, a pilot study from (Papadopoulou et al., 2019) shows no quarter differences in anthropometric and physiological characteristics in youth volleyball female players. In contrast, late-born youth basketball players have a "double disadvantage" in body height compared to their peers (Rubajczyk et al., 2017). Also, players in volleyball need to have strength and power in high performance during the game (Tania and Eliane 2003). Especially in the game of volleyball, this type of physical ability is of great importance (Tsunawake et al., 2003) knowing that volleyball is a sport with short intervals and efficient physical loads combined with rest phases. The coaches who deal with the training are convinced and oriented quite accurately that there is a difference in performance for the anthropometric parameters and physical abilities according to gender and positions in the field with regard to volleyball (Jacque et al.2007), (Tim and Boris 2007), (Zoran et al.2006), (Zoran et al.2007), (Katic et al. 2006) and (Smith et al.1992) and in other team sports (Mohamed et al. 2009 and Reilly et al. 2000).

Bompa and Buzzichelli (2018) revealed that the advantages of training using Circuit are: a) improving various components of physical condition simultaneously in a relatively short time., b) each sportsman can train according to his own progress, c) each sport can correct his own progress, d) training is easy to supervise, e) saving time, because with a relatively short time it can accommodate many people practicing at once. The circuit should not be used as a test or to make comparisons between sportsmen. Comparing sportsmen is unfair, because of the speed of performance. Instead, achievements need to be only compared to the abilities of previous sportsmen (Ikenna, et al., 2020).

The aim of this study was to find out the trend of improvement and differences with the age of anthropometric and physical abilities of boys' volleyball players in Albania.

MATERIALS & METHODS

Participants in this study were (N=120) volleyball players from three age categories as follows; (12-14 yrs.) No.40, (14-16 yrs.) No. 40, and (16-18 yrs.) No.40. Measurement for anthropometrics Body Weight (BW), Body Height (BH) and Waist Circumference (WC) and physical abilities (push up test, curl-up test, standing long jump and vertical test) were assessed. Measurements were done in Tirana which is the capital city of Albania.

Protocols of the test

Body weight and height; Weight- Players were asked to remove their footwear (shoes, slippers, sandals etc.) and socks and step onto a scale stadiometer. It was recorded the weight measurement in kilogram. Height- Players were asked to remove their footwear (shoes, slippers, sandals etc.) and socks and step onto a scale stadiometer. They were asked to stand on the board facing the coach and also were asked to stand with feet together and heels against the backboard. It was recorded the height measurement was in centimetres.

Circumference Waist (CW); <https://www.topendsports.com/testing/tests/girth-waist.htm> the measurement was taken without clothing, that is, directly over the skin. The measurement was taken at the end of a normal expiration, with the arms relaxed at the sides and under the midline of the participant's armpit, at the midpoint between the lower part of the last rib and the top of the hip.

Push up test; <https://www.topendsports.com/testing/tests/push-up.htm> . Push up test measures upper body strength and endurance. A standard push-up begins with the hands and toes touching the floor, the body and legs in a straight line, feet slightly apart, the arms at shoulder-width apart, extended and at a right angle to the body. The time performed at maximal was 30 seconds.

Curl up test; <https://www.topendsports.com/testing/tests/curl-up-partial.htm> . Curl-Up test measures abdominal muscular strength & endurance. The curl-up abdominal fitness test requires the subjects to perform as many curl-ups as possible for 30 seconds.

Standing long jump test (SLJ); <https://www.topendsports.com/testing/tests/longjump.htm> the volleyball player's place their feet over the edge of the sandpit, crouches down and using the arms and legs jump horizontally as far as possible landing with both feet into the sandpit. The coach measures and records the distance from the edge of the sandpit to the nearest impression made by the athlete in the sandpit. The players repeat the test 3 times

Vertical test CMJ and run-up; <https://www.topendsports.com/testing/tests/vertical-jump-runup.htm> CMJ- The countermovement jump (CMJ) is a simple, practical, valid, and very reliable measure of lower-body power. (Sargent Jump, Vertical Leap). Arm-Swing: The player must keep their hands on the hips throughout the test. In which case, the coach must also pay strict attention to the player's hands to ensure they are not using them to press additional force through their legs. During the flight: During their time spent in the air, it is essential that the player maintain extension in the hip, knee, and ankle joints to prevent them from achieving any additional flight time by bending their legs (Markovic et al.2004) and (Glatthorn et al. 2011). The player must perform a minimum of three jumps so that performance averages can be calculated. Run up; the coach decides before testing to include the use of the arm-swing and steps.

Statistical Analysis

ANOVA is a statistical analysis for testing whether there is no significant difference between two or more group's means. This study used one-way ANOVA to investigate the significant difference by age groups for volleyball boys' players. We also used the multiple comparisons statistic - LSD post hoc analysis showed results for variable measures in this study. After collecting field test data, it was used SPSS version 23, at $p \leq 0.05$ level

RESULTS

Data from table 1 show descriptive statistics (mean, Std. Dev.) for anthropometric variables for the three age categories group with regard to volleyball boys. Participants in this study were (No.120) volleyball players from three age categories as follows; (12-14 yrs.) No.40, (14-16 yrs.) No. 40, and (16-18 yrs.) No.40. Descriptive mean data are shown for body height, body weight and waist circumference.

Table1. Descriptive statistics for anthropometric

	Subjects	N	Mean	Std. Dev.
Body Height	(12-14)	40	148.6	15.4
	(14-16)	40	160.2	7.3
	(16-18)	40	166.5	7.4
	Total	120	158.8	12.8
Body Weight	(12-14)	40	45.1	14.0
	(14-16)	40	55.2	8.7
	(16-18)	40	64.7	13.0
	Total	120	55.4	14.4
CW	(12-14)	40	67.0	9.6
	(14-16)	40	66.6	6.9
	(16-18)	40	72.9	9.9
	Total	120	69.0	9.3

Data from table 2 show descriptive statistics (mean, Std. Dev.) for physical abilities variables for the three age categories group with regard to volleyball boys. Descriptive mean data are shown for Push up Test (strength upper body); curl up test (strength core body) and standing long jump test (explosive power lower limbs).

Table2. Descriptive statistics for physical abilities

	Subjects	N	Mean	Std. Dev.
Push ups 30s	(12-14)	40	3.6	3.8
	(14-16)	40	6.4	4.2
	(16-18)	40	7.3	6.0
	Total	120	4.9	4.5
Curl up 30s	(12-14)	40	18.8	4.0
	(14-16)	40	20.6	3.6
	(16-18)	40	21.7	3.3
	Total	120	19.7	3.9
SLJ	(12-14)	40	125.2	24.5
	(14-16)	40	161.2	23.1
	(16-18)	40	178.9	17.9
	Total	120	156.2	31.1

Data from table 3 show descriptive statistics (mean, Std. Dev.) for physical abilities variables for the three age categories group with regard to volleyball boys. Descriptive mean data are shown for vertical jump CMJ test (strength lower body limbs), vertical jump Run up test (strength lower body limbs).

Table 3 Descriptive statistics for vertical jump CMJ test.

	Subjects	N	Mean	Std. Dev.
CMJ	(12-14)	40	216.6	26.7
	(14-16)	40	233.3	26.6
	(16-18)	40	254.7	18.8
	Total	120	235.8	28.5
Vertical Jump Run Up	(12-14)	40	218.1	27.1
	(14-16)	40	237.7	27.0
	(16-18)	40	260.0	18.8
	Total	120	239.5	29.6

Data from table 4 show comparison data analysis (ANOVA) for anthropometric variables between the three age categories group with regard to volleyball boys. Comparison data between groups shown for body height ($F= 16.4$; $Sig= 0.000$), body weight ($F= 14.7$; $Sig= 0.000$), and waist circumference ($F= 3.7$; $Sig= 0.031$).

Table 4 Comparison data analysis (ANOVA)

	ANOVA	Sum of Squares	df	Mean Square	F	Sig.
BH	Between Groups	3648.0	2	1824.0	16.4	0.000
	Within Groups	7122.4	64	111.3		
	Total	10770.4	66			
BW	Between Groups	4326.3	2	2163.2	14.7	0.000
	Within Groups	9427.6	64	147.3		
	Total	13753.9	66			
WC	Between Groups	583.8	2	291.9	3.7	0.031
	Within Groups	5084.1	64	79.4		
	Total	5667.9	66			

Data analysis from (ANOVA) for physical variables between the three age categories group with regard to volleyball boys, comparison data between groups shown for push up test ($F= 2.5$; $Sig= 0.097$), curl up test ($F= 1.7$; $Sig= 0.204$), and standing long jump test ($F= 34.5$; $Sig= 0.000$). Data from analysis (ANOVA) for physical variables between the three age categories group with regard to

volleyball boys, comparison data between groups shown for vertical jump CMJ test ($F= 14.1$; $Sig= 0.000$), vertical jump Run up test ($F= 16.6$; $Sig= 0.000$). According to Multiple Comparisons- post hoc analysis (LSD) for anthropometric variables between the three age categories group with regard to volleyball boys, comparison data for body height between groups 12-14 vs.

The group 14-16 years show (mean difference= 11.5 cm; $Sig= 0.001$). The group 16-18 data show (mean difference= 6.3 cm; $Sig= 0.045$). Comparison data for body weight between groups 12-14 years is different group 14-16 show (mean difference= 10.1 kg; $Sig= 0.008$). Group 16-18 years data show (mean difference= 9.4 kg; $Sig= 0.010$). Comparison data for waist circumference between groups 12-14 and 14-16 show (mean difference= 0.4 cm; $Sig= 0.895$) while for 16-18 years data show (mean difference= 6.3 cm; $Sig= 0.019$). While the data of Multiple Comparisons- post hoc analysis (LSD) for physical variables between the three age categories group with regard to volleyball boys, comparison data for push up test between groups 12-16 show (mean difference= 2.9 counts; $Sig= 0.105$) while for 16-18 years data show (mean difference= 0.8 counts; $Sig= 0.699$). Comparison data for curl up test between groups 12-16 years show (mean difference= 1.7 counts; $Sig= 0.245$) while for 16-18 data show (mean difference= 1.1 counts; $Sig= 0.583$). Comparison data for standing long jump test between groups show (mean difference= 36 cm; $Sig= 0.000$). Data from Multiple Comparisons- post hoc analysis (LSD) for physical variables between the three age categories group with regard to volleyball boys. Comparison data for vertical jump CMJ test between groups 12-14 years show (mean difference= 16.7 cm; $Sig= 0.026$) while for 14-16 years and group 16-18 years data show (mean Difference = 21.3 cm; $Sig= 0.004$). Comparison data for vertical jump Run up test between groups 12-14 years show (mean difference= 19.7 cm; $Sig= 0.010$) while for 14-16 years and 16-18 years group data show (mean difference= 22.3 cm; $Sig= 0.003$).

DISCUSSION

This study investigated the differences between the 3 age groups for boys' volleyball players for anthropometric parameters and physical fitness components. Results from ANOVA analysis between three age categories show significant differences. Comparison data for body height between groups 12-14 and 14-16 -years show (mean difference= 11.5 cm; $Sig= 0.001$) while for 14-16 and 16-18 -years data show (mean difference= 6.3 cm; $Sig= 0.045$). The findings of this study are in line with the results of (Tessutti et al. 2019) which found significant differences for body height but results showed and differences for standing long jump where players +17 years old performed better than -14 years old. Data from this study for body weight between groups 12-14 and 14-16-years group show (mean difference= 10.1 kg; $Sig= 0.008$) while for 14-16 -and 16-18 years group data show (mean difference= 9.4 kg; $Sig= 0.010$). Comparison data for waist circumference between groups 14-16 years group show (mean difference= 0.4 cm; $Sig= 0.895$) while for 16-18 years group data show (mean difference= 6.3 cm; $Sig= 0.019$). Other data results from (Pantelis et al. 2015) showed that anthropometric parameters are age dependent but also significant differences were found between these 2 age categories which showed that physical performance seems to be dependent on the playing positions.

Data results from this study for strength using push up test between groups (mean difference= 2.9 counts; $Sig= 0.105$) while for 16-18 years group data show (mean difference= 0.8 counts; $Sig= 0.699$). Finding from different studies (Marques et al. 2009), (Seits et al. 2014) and (Hegedus et al. 2015) showed that significant differences in fitness parameters were found between game positions in a wide range of sports.

Comparison data of this study for the core strength using curl up test between groups 12-14 and 14-16- years show (mean difference= 1.7 counts; $Sig= 0.245$) while for 14-16 and 16-18-years data show (mean difference= 1.1 counts; $Sig= 0.583$) while for standing long jump test between groups 12-14 and 14-16 years show (mean difference= 36 cm; $Sig= 0.000$) while for 14-16 and 16-18 years data show (mean difference= 17.7 cm; $Sig= 0.008$).

Data of this study for jumping performance using vertical jump CMJ test between groups 12-14 and 14-16- years show (mean difference= 16.7 cm; $Sig= 0.026$) while for 14-16 and 16-18-years data show (mean difference= 21.3 cm; $Sig= 0.004$) while for vertical jump Run up test between groups. Also, most studies reveal that physical and physiological characteristics between playing positions in

boys' volleyball players are age dependent (Miclic et al. 2017), (Paz et al. 2017). This study has limitations with regards in the sampling number of boys' volleyball players which is justified for not having sufficient funds. In the best interest of the study, it would be good if other teams were involved from different cities of Albania. Suggestions for other studies we recommend in comparing data by positions in the field.

Final results show statistical increase between age categories for body weight, height and stranding long jump, vertical jump (CMJ and run up) while for the other measurement of physical fitness components no significant improvement was found mostly in boys' volleyball players with regard to age groups. Physical fitness abilities, mostly jumping and strength performance enable good performance for the spike and the block, as well as higher contact with the ball above the net (Paz Ga et al. 2017).

CONCLUSION

The final results show a statistical increase between age categories for body weight, height and stranding long jump, vertical jump (CMJ and run-up) while for the other measurement of physical fitness components no significant improvement was found mostly in boys' volleyball players with regard to age groups. Results showed that anthropometric parameters are age-dependent. This study has limitations with regards to the sampling number of boys' volleyball players which is justified for not having sufficient funds. In the best interest of the study, it would be good if other teams were involved from different cities of Albania. Suggestions for other studies we recommend in comparing data by positions in the field.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: We thank all the players and their coaches who made this process possible.

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

- Barnes, J. L., Schilling, B. K., Falvo, M. J., Weiss, L. W., Creasy, A. K., & Fry, A. C. (2007). Relationship of jumping and agility performance in female volleyball athletes. *The Journal of Strength and Conditioning Research*, 21(4), 1192. <https://doi.org/10.1519/r-22416.1>
- Bompa, T. O., & Buzzichelli, C. (2018). Periodization-6th Edition: Theory and Methodology of Training. *In Human Kinetics*.
- De Almeida, T. A., & Soares, E. A. (2003). Nutritional and anthropometric profile of adolescent volleyball athletes. *Revista Brasileira De Medicina Do Esporte*, 9(4), 198–203. <https://doi.org/10.1590/s1517-86922003000400002>
- Gabbett, T., & Georgieff, B. (2007). Physiological and anthropometric characteristics of Australian junior national, state, and novice volleyball players. *The Journal of Strength and Conditioning Research*, 21(3), 902. <https://doi.org/10.1519/r-20616.1>
- Glatthorn, J. F., Gouge, S., Nussbaumer, S., Stauffacher, S., Impellizzeri, F. M., & Maffiuletti, N. A. (2010). Validity and reliability of optojump photoelectric cells for estimating vertical jump height. *The Journal of Strength and Conditioning Research*, 25(2), 556–560. <https://doi.org/10.1519/jsc.0b013e3181ccb18d>
- Grgantov Z, Katić R, Janković V. (2006). Morphological characteristics, technical and situation efficacy of young female volleyball players. *Coll Antropol*. 30(1):87-96. PMID: 16617581. <https://pubmed.ncbi.nlm.nih.gov/16617581/>

- Hegedus, E. J., McDonough, S. M., Bleakley, C., Baxter, D., & Cook, C. E. (2015). Clinician-friendly lower extremity physical performance tests in athletes: a systematic review of measurement properties and correlation with injury. Part 2—the tests for the hip, thigh, foot and ankle including the star excursion balance test. *British Journal of Sports Medicine*, 49(10), 649–656. <https://doi.org/10.1136/bjsports-2014-094341>
- Hill, B., & Sotiriadou, P. (2016). Coach decision-making and the relative age effect on talent selection in football. *European Sport Management Quarterly*, 16(3), 292–315. <https://doi.org/10.1080/16184742.2015.1131730>
- Ikenna, U. C., Ngozichi, O. G., Ijeoma, I., Ijeoma, N., Ifeanyichukwu, N., & Martin, O. C. (2020). Effect of Circuit Training on the Cardiovascular Endurance and Quality of Life: Findings from an Apparently Healthy Female Adult Population. *Journal of Applied Life Sciences International*. Vol.23, N.3.1–8. <https://doi.org/10.9734/jalsi/2020/v23i330148>
- Katić, R., Grgantov, Z., & Jurko, D. (2006, March 16). *Motor structures in female volleyball players aged 14–17 according to technique quality and performance*. Vol.30, No.1. Pp.103-112. <https://hrcak.srce.hr/8898>
- Markovic G, Dizdar D, Jukic I, Cardinale M. (2004). Reliability and factorial validity of squat and countermovement jump tests. *J Strength Cond Res*. 18(3):551-5. <https://pubmed.ncbi.nlm.nih.gov/15320660/>
- Marques, M. C., Van Den Tillaar, R., Gabbett, T. J., Reis, V. M., & González-Badillo, J. J. (2009). Physical fitness qualities of professional volleyball players: Determination of positional differences. *The Journal of Strength and Conditioning Research*, 23(4), 1106–1111. <https://doi.org/10.1519/jsc.0b013e31819b78c4>
- Milić, M., Grgantov, Z., Chamari, K., Ardigo, L., 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*, 1, 19–26. <https://doi.org/10.5114/biolSport.2017.63382>
- Mohamed, H., Vaeyens, R., Matthys, S., Multael, M., Lefevre, J., Lenoir, M., & Philippaerts, R. (2009). Anthropometric and performance measures for the development of a talent detection and identification model in youth handball. *Journal of Sports Sciences*, 27(3), 257–266. <https://doi.org/10.1080/02640410802482417>
- Musch, J., & Grondin, S. (2001). Unequal competition as an Impediment to Personal development: A review of the Relative Age Effect in sport. *Developmental Review*, 21(2), 147–167. <https://doi.org/10.1006/drev.2000.0516>
- Pantelis, T. N., Afonso, J., Buško, K., Ingebrigtsen, J., Chtourou, H., & Jeffrey, J. M. (2015). *Positional differences of physical traits and physiological characteristics in female volleyball players – the role of age*. Vol.47, No.1. Pp.75-81. <https://hrcak.srce.hr/en/140254>
- Papadopoulou, S. D., Papadopoulou, S. K., Rosemann, T., Knechtle, B., & Nikolaidis, P. T. (2019). Relative age effect on youth female volleyball players: A pilot study on its prevalence and relationship with anthropometric and physiological characteristics. *Frontiers in Psychology*. Vol.10, Pp.2737. <https://doi.org/10.3389/fpsyg.2019.02737>
- Paz, G. A., Gabbett, T. J., Maia, M. F., Santana, H., Miranda, H., & Lima, V. (2017). Physical performance and positional differences among young female volleyball players. *The Journal of Sports Medicine and Physical Fitness*, 57(10). <https://doi.org/10.23736/s0022-4707.16.06471-9>
- Reilly, T., Williams, A. M., Nevill, A., & Franks, A. (2000). A multidisciplinary approach to talent identification in soccer. *Journal of Sports Sciences*, 18(9), 695–702. <https://doi.org/10.1080/02640410050120078>
- Rubajczyk K, Świerzek K, Rokita A. (2017). Doubly Disadvantaged? The Relative Age Effect in Poland's Basketball Players. *J Sports Sci Med*. 16(2):280-285. PMID: 28630582; PMCID: PMC5465991. <https://pubmed.ncbi.nlm.nih.gov/28630582/>
- Seitz, L. B., Rivière, M., De Villarreal, E. S., & Haff, G. G. (2013). The athletic performance of elite rugby league players is improved after an 8-Week Small-Sided game training intervention. *The*

- Journal of Strength and Conditioning Research*, 28(4), 971–975. <https://doi.org/10.1519/jsc.0b013e3182a1f24a>
- Smith, D., Roberts, D., & Watson, B. (1992). Physical, physiological and performance differences between canadian national team and universiade volleyball players. *Journal of Sports Sciences*, 10(2), 131–138. <https://doi.org/10.1080/02640419208729915>
- Subekti, N., Nurhidayat, Warthadi, A. N., Mujahid, H., & Rayhan, A. a. D. A. (2021). Analisis Performa Speed dan Power Athlet Pencak Silat Level Elit. *Jurnal Kepelatihan Olahraga SMART SPORT*, 18(1).pp.39-45. <https://doi.org/10.20961/rumi.v18i1.48507>
- Tessutti, L. S., Da Silva Aguiar, S., De Conti Teixeira Costa, G., Clemente, F. M., Lima, R. F., Neves, R. V. P., Praça, G. M., & De Oliveira Castro, H. (2019). Body composition and performance variables differences in female volleyball players by agegroup and playing position. *Brazilian Journal of Kinanthropometry and Human Performance*, 21. <https://doi.org/10.1590/1980-0037.2019v21e60131>
- Thissen-Milder M, Mayhew JL. (1991). Selection and classification of high school volleyball players from performance tests. *J Sports Med Phys Fitness*. 31(3):380-4. PMID: 1798309. <https://pubmed.ncbi.nlm.nih.gov/1798309/>
- Tsunawake, N., Tahara, Y., Moji, K., Muraki, S., Minowa, K., & Yukawa, K. (2003). Body composition and physical fitness of female volleyball and basketball players of the Japan Inter-high School Championship teams. *Journal of Physiological Anthropology and Applied Human Science*, 22(4), 195–201. <https://doi.org/10.2114/jpa.22.195>
- Viitasalo JT, Rusko H, Pjala O, Ahila M, Montonen H. (1987). "Endurance requirements in volleyball". *Can J App Sport Sci*. Vol.12; Pp.194-201. ID.10025954713
- Zoran Grgantov, Dragan Nedovic, Ratko Katic. (2007). "Integration of technical and situation efficacy into the morphological system in young female volleyball players". *Collegium Antropologicum*. Vol. 31, No. 1. P.p. 267 - 273. PMID: 17598412. <https://pubmed.ncbi.nlm.nih.gov/17598412/>

How to cite this article: Pogoni, A., & Lleshi, E. (2025). Assessment of Physical Components in Young Boys' Volleyball Players. *International Journal of Digital Research*, E-ISSN: 3033-179X, Vol. 1(1): P.p. 2-9. <https://doi.org/10.63711/ijdr.net20250101>
