RELATIVE AGE EFFECT AND TALENT IDENTIFICATION IN YOUTH VOLLEYBALL PLAYERS FROM THE POLISH VOLLEYBALL FEDERATION SPORTS SCHOOL

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Abstract
Introduction. This study sought to determine differences in the quarterly age distribution of young Polish volleyball players from the Sports School of the Polish Volleyball Federation (SS PVF), to investigate quarterly differences in anthropometric characteristics and jump test results.***Material and Methods.*** RAE of young players from SS PVF (n = 232) born between 1989 and 2002 was identified in the course of the research. Furthermore, the study included anthropometric characteristics and jump test results (attack jump – AJ). ***Results.*** The chi-square test (χ^2) revealed the overrepresentation of volleyball players born in quarters 1 and 2, both in the case of graduates ($\chi^2 = 27.32$, $p < 0.0001$) and students who did not finish school ($\chi^2 = 17.95$, $p < 0.0005$). Two-way ANOVA for unbalanced data for the Group factor showed significant differences in the value of estimated marginal means in the case of AJ ($F(1,214) = 5.907$, $p < 0.016$) and body mass (BM) ($F(1,214) = 5.348$, $p < 0.022$). ***Conclusions.*** These results point to the need for better understanding of RAE in order to avoid dropping out or the loss of potential talent, which will contribute to even greater development of volleyball in Poland.

Key words: volleyball, player selection, age effect, birth quarter, attack jump, championship players

Introduction

Relative age effect (RAE) is used to describe an advantage in sports performance of children born in the first half of the year in comparison to those born later in the year [1]. The prevalence of RAE is explained by physical and mental advantages of children born in the first months after the entry date in their selection year. Currently, the organisation and the grouping of volleyball players are done chronologically, as they are grouped in the categories by their natural year of birth. The main aim of forming groups with regard to age is to reduce cognitive, physical and emotional differences and to ensure fair competition between players [2, 3]. Unfortunately, even in this system, whose goal is to promote equality, there exist inequalities. Studies confirm that the division of athletes into age groups produces physical [4], cognitive [5], motivational [6] and existential [7] differences. Therefore, athletes born in January, compared to their peers born in the same year, may have an advantage related to their biological development of up to 364 days even though they compete in the same age category [8]. Thus, in a 2-year system, in which January 1st is the cut-off date, there may be a difference of up to 23 months between a child born in the first month of the year of a given category and a child born in December of the next year [9]. As a consequence, older players excel because they are taller, their skeletal system is better developed, and their physical performance is greater, which exerts a significant influence on their muscular system [7, 10]. This phenomenon is known as RAE – relative age effect [11].

RAE in team sports was noted both among adolescents and seniors in such sports as basketball [12, 13, 14], handball [15, 16] or football [17, 18, 19, 20]. Yet, RAE was not observed in other team sports like water polo [21] or rugby [22]. Research findings on RAE in volleyball players are not consistent. On the one hand, RAE was found in volleyball players from the top-level Japanese league [23], in female Brazilian youth volleyball players [24] or in female school students from Great Britain [25]. On the other hand, RAE was not noted in Dutch [26] and male Brazilian volleyball players [27] as well as in the Israeli league [28]. Practical knowledge of RAE may be really useful to coaches, as the observation of a disproportionately large number of older volleyball players would indicate some disfavour towards those born at a later date, thus increasing the risk of their resignation from practising volleyball. Moreover, from a practical point of view, it would be important to study correlations of RAE with somatic and motor parameters, which are absolutely essential in the process of talent identification in volleyball. Players born in the first quarter, who were more successful, were usually taller and lighter, and scored better in jumping ability tests than their peers born later in the year [29]. RAE is most often explained by earlier maturation [30], since adolescents who matured earlier outperformed their later-maturing counterparts [31].

The process of talent identification in volleyball is extremely challenging. It is mainly based on evaluating technical skills [32], tactical skills [33], motor abilities and physical features [34, 35] as well as perceptual and cognitive skills [36]. In addition, body height is considered to be the most valuable indicator of talent identification in volleyball [37, 38].

The Polish national team is one of the best teams in the world (World Champions in 2014 and 2018). Also, Polish league teams achieve spectacular successes (Grupa Azoty ZAKSA Kędzierzyn-Koźle – 2020/2021 Champions League winner). Furthermore, Polish youth national teams win top places during European and World Championships (World Champions U-21 in 2017 and U-19 in 2015 and 2021, European Champions U-21 in 2016). These results show that the system of talent identification works really well. In light of the above-mentioned research results on RAE in volleyball players, it would be interesting to

analyse this phenomenon in the best Polish youth volleyball players.

Therefore, this study sought to determine differences in the quarterly age distribution of young Polish volleyball players from SS PVF, to investigate quarterly differences in anthropometric characteristics and jump test results, and to identify how quarterly differences of the above-mentioned indicators affect the level of the players' sports performance after finishing SS PVF.

Material and Methods

The study included 232 students (born between 1989 and 2002) from the Sports School supervised by the Polish Volleyball Federation (SS PVF). The school specialises in training adolescent volleyball players in younger junior and junior categories. The Polish system of talent identification involves three stages: stage 1 – observation of players during the Olympic Hopes Tournament, stage 2 – observation during youth competitions, i.e. Younger Junior and Junior Polish Championships, stage 3 – observation of players selected for training consultations. The final step is the selection for the elite Sports School.

All the information about the players was extracted from the official website of SS PVF, available at http://www.smsspala.pl, from http://plusliga.pl, http://tauronlliga.pl as well as from websites of the clubs that the players represented. The data obtained included the date of birth, anthropometric measurements and results of the jump test (attack jump – AJ).

The cut-off date in the system of FIVB and PVF is January 1st. Therefore, birth dates of the players were classified in four calendar quarters: Q1 (January-March), Q2 (April-June), Q3 (July-September) and Q4 (October-December). The birth quarter (Q) was defined as an independent variable, whereas somatic build parameters and motor abilities were considered to be dependent variables.

First, normality of distribution and homogeneity of variance of the data were checked using Shapiro-Wilk test. The test results at the significance level of $\alpha = 0.05$ confirmed the hypothesis on normality of distribution and homogeneity of the data variance. To determine the differences between the actual and expected distributions of birth dates in each quarter, the chi-square test (χ^2) was applied. Moreover, two-way AVOVA for unbalanced data was employed to study the differences between anthropometric characteristics and the motor test results for birth quarters (Q1 … Q4) and groups (G1 and G2 – graduates and students who did not manage to complete their school education). The level of significance was set at $\alpha < 0.05$. Statistical analysis was performed using STATISTICA 13.3 (StatSoft, Poland).

Results

In order to determine differences in the number of births of volleyball players from SS PVF in particular quarters, percentage values were used. Table 1 shows quarterly age distribution for young volleyball players – graduates and students who did not manage to complete their school education at SS PVF. In both cases, we noted the overrepresentation of volleyball players born in Q1 and Q2 (65.5% and 72.7%, respectively). In turn, an underrepresentation of births in Q4 was 9.0% and 5.4%, respectively. The differences proved to be statistically significant both for graduates and those who did not finish school $p < 0.001$ ($\chi^2 = 27.32$, p<0.0001 and $\chi^2 = 17.95$, p < 0.0005).

Table 1. Quarterly age distribution in elite volleyball players from SS PVF in Spala in the years 1989-2002.

Q1 (%)	Q2 (%)	Q3 (%)	Q4 (%)	Total	χ^2	p
All volleyball players from SS PVF						
87 (37.5%)	69 (29.7%)	57 (24.6%)	19 (8.2%)	232	42.83	p < 0.0001
Volleyball players – graduates of SS PVF (G1)						
62 (35.1%)	54 (30.5%)	45 (25.4%)	16 (9.0%)	177	27.32	p < 0.0001
Volleyball players – students who did not manage to graduate from SS PVF (G2)						
25 (45.4%)	15 (27.4%)	12 (21.8%)	3 (5.4%)	55	17.95	p < 0.0005

Table 2. Anthropometric characteristics and the attack jump test results in Polish volleyball players in four birth quarters.

| Index	Q1	Q2	Q3	Q4
Graduates of SS PVF in Spala (G1)				
	n = 62	n = 54	n = 45	n = 16
Body height [cm]	196.5 ± 7.56	197.5 ± 8.01	196.3 ± 6.37	196.5 ± 8.84
Body mass [kg]	86.2 ± 8.27	88.0 ± 9.65	87.4 ± 8.49	87.6 ± 9.02
Rohrer's Index [g/cm³]	1.14 ± 0.11	1.12 ± 0.10	1.15 ± 0.08	1.16 ± 0.12
Attack jump reach [cm]	337.8 ± 18.18	338.7 ± 15.61	337.4 ± 11.63	341.3 ± 15.21
Students who did not manage to graduate from SS PVF in Spala (G2)				
	n = 25	n = 15	n = 12	n = 3
Body height [cm]	198.4 ± 5.45	198.1 ± 4.98	198.5 ± 3.98	185.0 ± 8.02
Body mass [kg]	86.8 ± 9.90	83.9 ± 5.85	85.2 ± 7.19	77.33 ± 2.52
Rohrer's Index [g/cm³]	1.11 ± 0.08	1.08 ± 0.07	1.09 ± 0.09	1.22 ± 0.18
Attack jump reach [cm]	337.2 ± 9.81	339.0 ± 14.90	337.4 ± 8.87	321.7 ± 5.51

Anthropometric characteristics and the results of the AJ test depending on the birth quarter are presented in table 2.

Figure 1 shows the results of the variance analysis for the dependent variable AJ. The only significant differences were noted between estimated marginal means for the Group factor (Fig. 1, top-right).

A similar analysis of anthropometric variables revealed significant differences between estimated marginal means for BM only ($F_{(1,214)} = 5.348$, p = 0.022).

Discussion

The aim of the study was to determine differences in the quarterly age distribution of young Polish volleyball players from SS PVF, to investigate quarterly differences in anthropometric characteristics and jump test results. The findings confirm the occurrence of RAE in the elite volleyball Polish Sports School. Similar RAE was noted both in students who did not finish school and in graduates. In both groups, we found the overrepresentation of volleyball players born in Q1 and Q2.
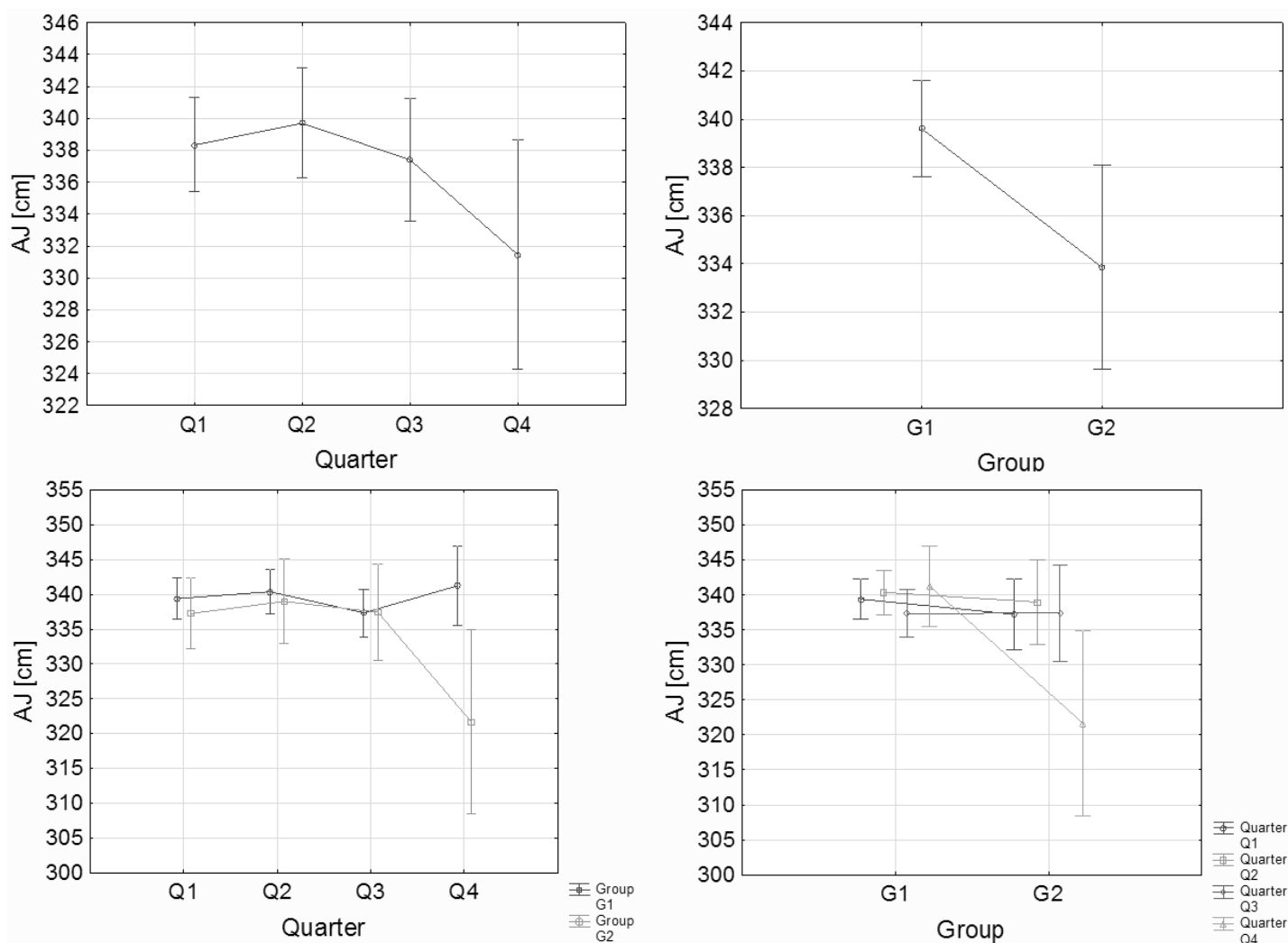
Figure 1. Estimated marginal means for Quarter (top-left, $F_{(3,214)} = 1.427$, $p = 0.236$), Group (top-right, $F_{(1,214)} = 5.907$, $p = 0.016$) and interactions Quarter*Group (bottom, $F_{(3,214)} = 2.001$; $p = 0.114$). Vertical bars indicate 95% confidence intervals

The occurrence of RAE in the Polish system of training is consistent with the findings of other researchers [24, 39]. However, the overrepresentation of the players born earlier may be explained by means of the theory of biological maturation, which is based on differences in the maturation of physical and physiological characteristics (body height, body mass, strength, speed, endurance, aerobic capacity) in one age group [40]. It often happens that players born in the last months of the year are viewed as less talented. Therefore, they can suffer from exclusion or even resign from practising sport. It is associated with biological factors such as motivation and self-esteem. As a consequence, such individuals suspend training before they are able to become mature athletes. If they reached senior levels of competition, they might perform in the manner similar to that of the players who were selected earlier.

Nevertheless, the fact that RAE occurs in volleyball is caused by coaches' common routines in the process of talent identification. While looking for talented individuals, they focus on weight and height parameters as well as jump test results, which are the main success factors in volleyball but they are very sensitive in terms of differentiation in biological development [41, 42]. As a result, a lot of young promising players may be omitted due to an unfavourable age-related situation (too much focus is given to physical features in youth sport).

Our analysis of anthropometric parameters and jumping abilities in graduates and students who did not manage to finish SS PVF in Spala revealed significant differences only in the case of AJ and BM. It also shows that body height, body mass and jumping abilities are variables which affect coaches' decisions on which young and talented volleyball players to admit to SS PVF in Spala. The achievements of male U-19 and U-21 Polish national teams, whose players mainly come from SS PVF in Spala, indicate that mass and height parameters characterise the best players and are an important factor when it comes to performance at the highest level [43, 44]. This relationship was also confirmed by the study which pointed to body height and jumping abilities in the context of selection for the female volleyball national team [42].

The limitation of this study is the fact that it was conducted on young volleyball players; therefore, caution should be exercised when generalising the findings to adult players. The study has both practical and theoretical applications that practitioners and researchers may find useful. From a practical standpoint, it is suggested that coaches should react when seeing RAE by e.g. setting individual goals for the players, in order to prevent the dropout of potential talents. From a theoretical viewpoint, RAE in the examined young players may indicate that the birth

quarter at a young age may affect performance, which is conditioned by high physical parameters.

It is worth noting that the current study as well as other aforementioned studies comprise simple anthropometric measurements without carrying out a detailed analysis of body composition, which may limit the predictability and efficiency of the talent identification process in adolescents, whose relative body mass is considered as a particularly important factor [45].

The results of this study indicate that volleyball clubs and federations should take measures to minimise RAE. It prevents early exclusion of potential talents born in the second half of the year and develop fairer and more effective selection procedures, since taking into account physical abilities only may not be enough in the long run.

Conclusions

The present study concludes that RAE occurs in the Polish school responsible for professional training of volleyball players. These findings show the need for better understanding of RAE in order to avoid dropping out or the loss of potential talent, which may contribute to even greater development of volleyball in Poland.

References

1. Bell J.F., Massey A., Dexter T. (1997). Birthdate and ratings of sporting achievement: Analysis of physical education GCSE results. *European Journal of Physics Education* 2(2), 160-166. DOI: 10.1080/1740898970020203.
2. Ramos S., Volossovitch A., Paulo Ferreira A., Fragoso I., Massuça L. (2019). Differences in maturity, morphological and physical attributes between players selected to the primary and secondary teams of a Portuguese Basketball elite academy. *Journal of Sports Science* 37(15), 1681-1689. DOI: 10.1080/02640414.2019.1585410.
3. Hancock D.J., Adler A.L., Cote J. (2013). A proposed theoretical model to explain relative age effects in sport. *European Journal of Sport Science* 13(6), 630-637. DOI: 10.1080/17461391.2013.775352.
4. Delorme N., Raspaud M. (2009). Is there an influence of relative age on participation in non-physical sports activities? The example of shooting sports. *Journal of Sports Sciences* 27(10), 1035-1042. DOI: 10.1080/02640410902926438.
5. Bisanz J., Morrison F.J., Dunn M. (1995). Effects of age and schooling on the acquisition of elementary quantitative skills. *Developmental Psychology* 31(2), 221-236. DOI: 10.1037/0012-1649.31.2.221.
6. Dixon J., Horton S., Weir P. (2011). Relative age effects: Implications for leadership development. *International Journal of Sport and Society* 2(2), 1-15.
7. 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. DOI: 10.1006/drev.2000.0516.
8. Kalinski S. D., Jelaska I., Knezević N. (2017). Age effects among elite male gymnasts. *Acta Kinetics* 11(2), 84-89.
9. Johnson A., Farooq A., Whiteley R. (2017). Skeletal maturation status is more strongly associated with academy selection than birth quarter. *Science and Medicine in Football* 1(2), 157-163. DOI: 10.1080/24733938.2017.1283434.
10. Cobley S., Baker J., Wattie N., McKenna J. (2009). Annual age-grouping, and athlete development – a meta-analytical review of relative age effects in sport. *Sports Medicine* 39(3), 235-256. DOI: 10.2165/00007256-200939030-00005.
11. Grondin S., Deshaies P., Nault L.P. (1984). Quarters of birth and participation in hockey and volleyball. *La Revne Quebecoise de l`Activite Physique* 2, 97-103.
12. Arrieta H., Torres-Unda J., Gil S. M., Irazusta J. (2016). Relative age effect and performance in the U16, U18 and U20 European basketball championships. *Journal of Sports Sciences* 34(16), 1530-1534. DOI: 10.1080/02640414.2015.1122204.
13. Subijana C.L., Lorenzo J. (2018). Relative age effect and long-term success in the Spanish soccer and basketball national teams. *Journal Human Kinetics* 65, 197-204. DOI: 10.2478/hukin-2018-0027.
14. Werneck F.Z., Coelho E.F., De Oliveira H.Z., Júnior D.B.R., Almas S.P. et al. (2016). Relative age effect in Olympic basketball athletes. *Science and Sports* 31(3), 158-161. DOI: 10.1016/j.scispo.2015.08.004.
15. Gomez-Lopez M., Angosto Sanchez S., Granero-Gallegos A., Chirosa Ríos L. J. (2017). Relative age effect in handball players of Murcia: Influence of sex and category of game. *Journal of Human Sport and Exercise* 12(3), 565-573. DOI: 10.14198/jhse.2017.123.01.
16. Schorer J., Cobley S., Busch D., Brautigam H., Baker J. (2009). Influences of competition level, gender, player nationality, career stage and playing position on relative age effects. *Scandinavian Journal of Medicine and Science in Sports* 19(5), 720-730. DOI: 10.1111/j.1600-0838.2008.00838.x.
17. Folgado H.A., Caixinha P.F., Sampaio J., Macas V. (2006). Relative age effects among youth soccer players according to playing positions. *Revista Portuguesa de Ciencias do Desporto* 6(3), 349-355.
18. Rubajczyk K., Rokita A. (2018). The relative age effect in poland's elite youth soccer players. *Journal Human Kinetics* 64(1), 265-273. DOI: 10.1515/hukin-2017-0200.
19. González-Víllora S., Pastor-Vicedo J.C., Cordente D. (2015). Relative age effect in UEFA championship soccer players. *Journal of Human Kinetics* 47(1), 237-248. DOI: 10.1515/hukin-2015-0079.
20. Skorski S., Skorski S., Faude O., Hammes D., Meyer T. (2016). The relative age effect in German elite youth soccer: implications for a successful career. *International Journal of Sports Physiology and Performance* 11(3), 370-376. DOI: 10.1123/ijspp.2015-0071.
21. Barrenetxea-Garcia J., Torres-Unda J., Esain I., Gil S.M. (2018). Relative age effect and left-handedness in world class water polo male and female players. *Laterality* 24(3), 259-273. DOI: 10.1080/1357650X.2018.1482906.
22. Jones B.D., Lawrence G.P., Hardy L. (2018). New evidence of relative age effects in "super-elite" sportsmen: a case for the survival and evolution of the fittest. *Journal of Sports Science* 36(6), 697-703. DOI: 10.1080/02640414.2017.1332420.
23. Nakata H., Sakamoto K. (2012). Sex differences in relative age effects among Japanese athletes. *Perceptual and Motor Skills* 115(1), 179-186. DOI: 10.05.17.PMS.115.4.179-186.
24. Okazaki F.H.A., Keller B., Fontana F.E., Gallagher J.D. (2011). The relative age effect among female Brazilian youth volleyball players. *Research Quarterly for Exercise and Sport* 82(1), 135-139. DOI: 10.1080/02701367.2011.10599730.
25. Reed K.E., Parry D.A., Sandercock G.R.H. (2017). Maturational and social factors contributing to relative age effects in school sports: data from the London youth games. *Scandinavian Journal of Medicine and Science in Sports* 27(12), 2070-2079. DOI: 10.1111/sms.12815.

26. van Rossum J.H.A. (2006). Relative age effect revisited: findings from the dance domain. *Perceptual and Motor Skills* 102(2), 302-308. DOI: 10.2466/pms.102.2.302-308.

27. Parma J.O., Penna E.M. (2018). The relative age effect on Brazilian elite volleyball. *Journal of Physical Education* 29. DOI: 10.4025/jphyseduc.v29i1.2942.

28. Lidor R., Arnon M., Maayan Z., Gershon T., Cote J. (2014). Relative age effect and birthplace effect in division 1 female ballgame players – the relevance of sport-specific factors. *International Journal of Sport Exercise Psychology* 12(1), 19-33. DOI: 10.1080/1612197X.2012.756232.

29. Milić M., Grgantov Z., Chamari K., Ardigo 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. DOI: 10.5114/biolsport.2017.63382.

30. Pena-González I., Fernández-Fernández J., Moya-Ramón M., Cervelló E. (2018). Relative age effect, biological maturation, and coaches' efficacy expectations in young male soccer players. *Research Quarterly for Exercise and Sport* 89(3), 373-379. DOI: 10.1080/02701367.2018.1486003.

31. Cripps A.J., Hopper L., Joyce C. (2016). Maturity, physical ability, technical skill and coaches perception of semi-elite adolescent Australian footballers. *Pediatric Exercise Science* 28(4), 535-541. DOI: 10.1123/pes.2015-0238.

32. Jager J.M., Schollhorn W.I. (2007). Situation-orientated recognition of tactical patterns in volleyball. *Journal of Sports Science* 25(12), 1345-1353. DOI: 10.1080/02640410701287230.

33. Rikberg A., Raudsepp L. (2011). Multidimensional performance characteristics in talented male youth volleyball players. *Pediatric Exercise Science* 23(4), 537-548. DOI: 10.1123/pes.23.4.537.

34. Marcelino R., Afonso J., Moraes J., Isabel M. (2014). Determinants of attack players in high-level men's volleyball. *Kinesiology* 46(2), 234-241.

35. Lima R., Rico-Gonzalez M., Pereira J., Caleiro F., Clemente F. (2021). Reliability of a reactive agility test for youth volleyball players. *Polish Journal of Sport and Tourism* 28(1), 9-13. DOI: 10.2478/pjst-2021-0002.

36. Alves H., Voss M.W., Boot W.R., Deslandes A., Cossich V. et al. (2013). Perceptual-cognitive expertise in elite volleyball players. *Frontiers in Psychology* 4, 36. DOI: 10.3389/fpsyg.2013.00036.

37. Aouadi R., Jlid M.C., Khalifa R., Hermassi S., Chelly M.S. et al. (2012). Association of anthropometric qualities with vertical jump performance in elite male volleyball players. *The Journal of Sports Medicine and Physical Fitness* 52(1), 11-17.

38. Carvalho A., Roriz P., Duarte D. (2020). Comparison of morphological profiles and performance variables between female volleyball players of the first and second division in Portugal. *Journal of Human Kinetics* 71, 109-117. DOI: 10.2478/hukin-2019-0076.

39. Campos F., Stanganelli L.R., Rabelo F., Campos L., Pellegrinotti I. (2016). The relative age effect in male volleyball championships. *International Journal of Sports Science* 6(3), 116-120.

40. Helsen W.F., Van Winckel J., Williams A.M. (2005). The relative age effect in youth soccer across Europe. *Journal of Sports Science* 23(6), 629-636. DOI: 10.1080/02640410400021310.

41. Petroski E.L., Fraro J.D., Fidelix Y.L., Silva D.A.S., Pires-Neto C.S. et al. (2013). Anthropometric, morphological and somatotype characteristics of athletes of the Brazilian Men's volleyball team: An 11-year descriptive study. *Revista Brasileira de Cineantropometria e Desempenho Humano* 15(2), 184-192. DOI: 10.5007/1980-0037.2013v15n2p184.

42. Tsoukos A., Drikos S., Brown L. E., Sotiropoulos K., Veligekas P., Bogdanis G.C. (2019). Anthropometric and motor performance variables are decisive factors for the selection of junior national female volleyball players. *Journal Human Kinetics* 67, 163-173. DOI: 10.2478/hukin-2019-0012.

43. Sattler T., Hadzic V., Dervisevic E., Markovic G. (2015). Vertical jump performance of professional male and female volleyball players: effects of playing position and competition level. *The Journal of Strength & Conditioning Reserch* 29(6), 1486-1493. DOI: 10.1519/jsc.0000000000000781.

44. Czaplicki A., Śliwa M., Szyszka P., Sadowski J. (2017). Biomechanical assessment of strength and jumping ability in male volleyball players during the annual training macrocycle. *Polish Journal of Sport and Tourism* 24(4), 221-227. DOI: 10.1515/pjst-2017-0021.

45. Khanna A., Singh A., Singh B.P, Khan F. (2020). Cardiorespiratory fitness in university level volleyball players and its correlation with body fat. *Polish Journal of Sport and Tourism* 27(3), 15-19. DOI: 10.2478/pjst-2020-0015.