

## MODERN ASPECTS OF FORMATION OF NATIONAL TEAMS IN PLAYING SPORTS IN THE CONDITIONS OF GLOBALIZATION

### СУЧАСНІ АСПЕКТИ ФОРМУВАННЯ НАЦІОНАЛЬНИХ ЗБІРНИХ КОМАНД ІГРОВИХ ВИДІВ СПОРТУ В УМОВАХ ГЛОБАЛІЗАЦІЇ

Shlonska O. L.<sup>1</sup>, Borysova O. V.<sup>2</sup>, Yakusheva Yu. I.<sup>3</sup>

<sup>1,2</sup>National University of Ukraine on Physical Education and Sport, Kyiv, Ukraine

<sup>3</sup>National Pirogov Memorial Medical University, Vinnitsia, Ukraine

<sup>1</sup> ORCID: 0000-0001-7069-777X

<sup>2</sup> ORCID: 0000-0002-2311-1921

<sup>3</sup> ORCID: 0000-0001-8678-6128

DOI <https://doi.org/10.32782/2522-1795.2024.18.3.22>

#### Abstracts

At present, among team sports, including volleyball, there is an intensification of sports competition in the international arena, which is due to the trends of professionalization, commercialization, and globalization. Competitive activity in volleyball is constantly changing, taking into account the trends in the development of the game. The system of international competitions is expanding, and more and more attention is being paid to the preparedness of players of different playing roles, which prompts the justification of modern approaches to the formation of national teams. **Material and Methods.** The study analyzes the ratio of medals won by women's national volleyball teams (17 teams) according to the results of the Olympic Games and World Championships. In order to determine the peculiarities of the formation of national volleyball teams, the data of 288 athletes was analyzed, taking into account their age. The indicators of the competitive activity of the 15 best-qualified volleyball players in the world, taking into account their playing roles, which are marked in the ranking of the International Volleyball Federation based on the results of their performance in the Nation League in 2023, are determined. **Results.** The results of the study show that at the present stage of the development of volleyball, there is a change in leadership positions based on the results of athletes' performances in major international competitions, which is confirmed by its development in South America, North America, and East Asia. It has been determined that one of the leading factors in the formation of national teams in volleyball is the age of the players, their professional experience in international competitions, and the number of Olympic training cycles. Based on the results of the performance of the Brazilian women's national volleyball team, which is currently the world's leading team, it was found that the tendency to involve players aged 26 to 31 years remains in the formation of national teams. At the same time, in recent years, the number of female athletes over the age of 32 has been gradually increasing, with the largest number of them in 2020. **Conclusions.** The analysis of the development of volleyball has shown that the use of modern world experience in the rational formation of the composition of women's national volleyball teams has established that an integral component is the age of the players, their professional experience on the national team, and the presence of universal abilities to perform several game roles. At this stage of volleyball's development, there is a tendency to increase the age of female athletes involved in national teams, which ensures effective rotation over several Olympic cycles.

**Key words:** team formation, international competitions, age.

Натепер серед командних видів спорту, в тому числі і у волейболі, спостерігається загострення спортивної конкуренції на міжнародній арені, що зумовлено тенденціями професіоналізації, комерціалізації та глобалізації. Змагальна діяльність у волейболі постійно змінюється з урахуванням тенденцій розвитку гри. Розширюється система міжнародних змагань, усе більше уваги приділяється підготовленості гравців різних ігрових амплуа, що спонукає до обґрунтування сучасних підходів до формування національних збірних команд. У зв'язку з цим виявлення сучасних тенденцій формування жіночих національних збірних команд з волейболу в умовах глобалізації є надзвичайно важливим та актуальним. **Матеріал і методи.** У дослідженні проаналізовано співвідношення медалей,

завойованих жіночими національними збірними командами з волейболу (17 команд) за результатами Олімпійських ігор та чемпіонатів світу. З метою визначення особливостей формування національних збірних команд з волейболу проаналізовано дані 288 спортсменок з урахуванням їхнього віку. Визначено показники змагальної діяльності 15 найбільш кваліфікованих волейболістів світу з урахуванням їхніх ігрових амплуа, які відзначені в рейтингу Міжнародної федерації волейболу за результатами виступу в Національній лізі у 2023 році. **Результати.** Результати дослідження свідчать, що на сучасному етапі розвитку волейболу відбувається зміна лідерських позицій за підсумками виступів спортсменів на найбільших міжнародних змаганнях, що підтверджується його розвитком у Південній Америці, Північній Америці та Східній Азії. Визначено, що одними з провідних чинників формування національних збірних команд з волейболу є вік гравців, їхній професійний досвід виступів на міжнародних змаганнях та кількість циклів олімпійської підготовки. За результатами виступів жіночої збірної Бразилії з волейболу, яка нині є провідною командою світу, виявлено, що у формуванні національних команд зберігається тенденція залучення гравців віком від 26 до 31 року. Водночас останніми роками поступово збільшується кількість спортсменок віком понад 32 роки, причому найбільше їх було у 2020 році. **Висновки.** Аналіз розвитку волейболу показав, що використання сучасного світового досвіду раціонального формування складу жіночих національних збірних команд з волейболу дозволило встановити, що невід'ємною складовою частиною є вік гравців, їхній професійний досвід виступів у національній команді, наявність універсальних здібностей до виконання декількох ігрових амплуа. На цьому етапі розвитку волейболу спостерігається тенденція до збільшення віку спортсменок, які залучаються до складу національних збірних, що забезпечує ефективну ротацию протягом декількох олімпійських циклів.

**Ключові слова:** формування команди, міжнародні змагання, вік.

### **Introduction.**

The current stage of development of team game sports is characterized by global changes, which are associated with the formation of a system of international competitions [1]; expansion of the geography of development of sports games on a global scale; migration of players and coaches; their concentration in the strongest leagues in the world [4]; the international nature of team formation [9]; an increase in the number of commercial starts [10]; further professionalization of athletes at the national and international levels [13]; and politicization and socialization (transition from mass sport to a profession). All of this affects the success of athletes in international competitions, where the main factor is the effectiveness of their competitive activity.

The influence of globalization on the development and problems of Olympic and professional sports, including team sports, was considered in the works of domestic and international scientists O.V. Borisova [1], V.M. Kostyukevich [13], O.A. Shynkaruk, M.V. Dutchak, Y.O. Pavlenko [6], O.M. Kirilenko [3], R.O. Sushko [4], J. Jimenez, M. Pitin, A. Dmytrenko [5], Sophia Gaenssle & Arne Feddersen [10], Srđan Marković, Ivan Ćuk, Aleksandar Živković [17] and others. The authors

of the studies note that the development of global culture is currently taking shape, which leads to changes in the national sports system. More and more attention is being paid to the impact of professionalization and commercialization on the development of top-performance sports and the importance and necessity of national teams' participation in major international competitions as an important component of the country's image in the international space.

These processes contributed to the formation of the club system of competition in the world, which led to the transition of top-level sport into a neutral transnational commodity, resulting in the emergence of market relations ("buying and selling") [21]. The international composition of teams is more a consequence of the fulfillment of contractual obligations between team management and individual players. The current situation has some contradictions, which are reflected, on the one hand, in the weakening of the national championship and are a consequence of the formation of national teams exclusively by legitimate players; on the other hand, the transfer of talented athletes who are able to gain professional experience in the championships and leagues of other countries, which will improve and maintain their professional skills when recruiting national teams.

Currently, team sports have unified systems of Olympic and professional sports, which have significant differences in the system of international competitions. While basketball, handball, and ice hockey have separate systems of Olympic and professional sports, volleyball is developing a professional structure within the Olympic direction. The actual problems of forming national teams in game sports are widely represented in the modern bibliography on the materials of basketball, football, and handball. International experts have presented a modern approach to the selection of players for different game roles based on the analysis of individual player ratings, which confirms the effectiveness of their competitive activity. In volleyball, this scientific problem is not sufficiently covered. Therefore, in such conditions, it becomes extremely important to study modern trends that ensure the effectiveness of performances and team formation in volleyball, which confirms the relevance of our study.

The aim of the study is to identify the main trends in the formation of women's national teams in volleyball and basketball, taking into account the processes of globalization.

#### **Materials and Methods.**

The study analyzed the ratio of medals won by women's national volleyball teams (17 teams) based on the results of the Olympic Games and World Championships, which contributed to the identification of leading countries with intensive volleyball development. In order to determine the peculiarities of the formation of national volleyball teams, the data of 288 female athletes was analyzed, taking into account their age, playing roles, and the number of Olympic cycles in which they participated. The competitive performance of the 15 best-qualified volleyball players in the world was determined, taking into account their playing roles, which are marked in the ranking of the International Volleyball Federation based on the results of their performance in the Nation League in 2023. A total of 50 games were analyzed.

Based on comparative analysis and comparison, the researchers compared the ratio of medals won by national women's

volleyball teams in the world based on the results of competitions at the Olympic Games and World Championships; compared the age of athletes of the national teams of Brazil and the United States as the main criterion for the formation of teams in volleyball; compared the dynamics of prize funds with the participation of athletes in the World League (World Grand Prix) and the number of participating teams in the period from 1990 to 2023. This method was applied on the basis of the analysis and study of documentary materials on the World Wide Web (websites of the International Volleyball Federation, International Basketball Federation, and Volleyball Nation League). The analysis of the competitive activity of the world's leading volleyball players was carried out on the basis of video viewing of the competitive activity and its subsequent interpretation. The main criteria are the effectiveness of the technical and tactical actions of volleyball players in different game roles (serving, passing, blocking, receiving the serve, and defensive actions). This approach allowed us to define the parameters of competitive activity that influence the efficiency of the formation of national teams in volleyball.

The data obtained as a result of the analysis of competitive activity were processed using standard statistical methods included in the software packages *Statistica 7.0* (Stat Soft) and *MC Exel* on a PC. In this research, the method of average values was used on the basis of the calculation of the average value of indicators ( $\bar{x}$ ), average square deviation ( $S$ ), which allowed us to understand the regularities of the formation of national teams in volleyball.

**Results.** The concept of globalization in sport was first mentioned in the early 20th century, when the most important international competitions (Olympic Games and World Championships) became global in scope due to their increasing importance, the integration of countries around the world, and the migration of athletes to various clubs on a continental and global scale [16: 17].

At present, the presence of certain international relations is of particular importance in modern Olympic sport, which is seen as a form of

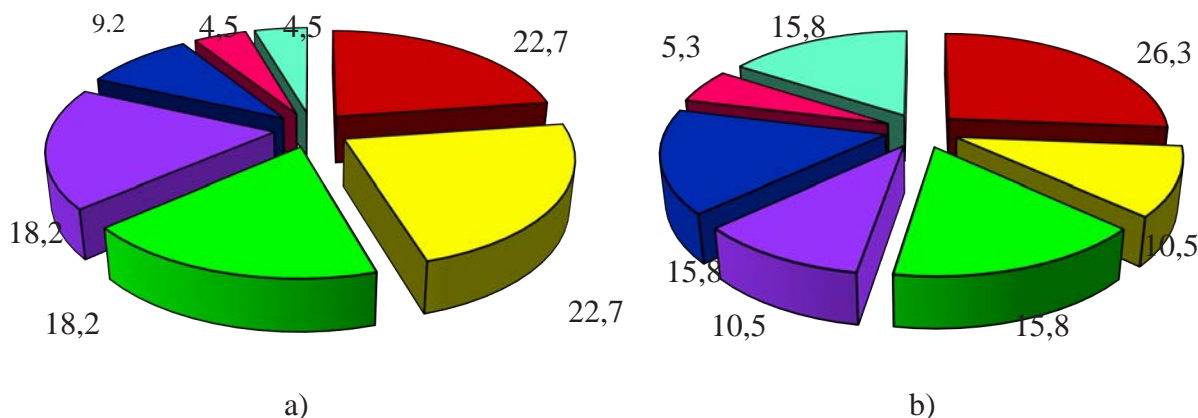
intercultural communication and is becoming an integral part of integration processes [9]. This is due to the expansion of the system of international competition and the interest of various political groups in their information support through the media. The Olympic Games and World Championships attract the attention of millions of people and involve interstate and international ties that help reduce tensions between different ethnic groups and cultures and unite people of different nationalities around the common goal and values of the international Olympic movement. The high popularity of sports leads to a great deal of interest from fans and the media in the achievements of the best players, who in turn lead by example in demonstrating tolerance and intercultural understanding to help reduce international differences in different racial groups.

Participation of athletes in the most important international competitions is an opportunity for players to demonstrate a high level of sportsmanship, which allows them to determine the leader, develop trends in team sports, and analyze the experience of leading countries in the development of sports games [3; 16; 20]. Figure 1 shows the ratio of medals won by women’s national volleyball teams based on the results of their performances at the Olympic Games and World Championships.

The analysis of the performances of women’s national volleyball teams in the Olympic Games from 1990 to 2022 (Fig. 1) shows that in this

period of volleyball development, seven teams won medals, four of which had the highest performance: Brazil (22.7%), the USA (22.7%), China (18.2%), and Cuba (18.2%). The data obtained indicate the formation of prerequisites for the intensive development of women’s volleyball in North America, South America, and East Asia. The results of women’s national teams’ performances in the World Championships show an increase in the number of winning teams and the number of leading teams with certain achievements in volleyball. Thus, the national teams with the largest number are Brazil (26.3%), China (15.8%), Italy (15.8%) and Serbia (15.8%). These national teams influence the formation of modern trends in volleyball competition.

The high level of competition currently observed in team sports requires athletes to be in optimal physical shape for a long time and participate in various types of competitions at the national and international levels. This is especially true for participation in commercial events [10; 11]. Financial compensation sometimes does not cover the costs of restoring the health and vital functions of certain systems of the players’ body, which leads to an early end to their sports career. Therefore, in the long-term training of high-class volleyball players, it is necessary to improve the system of training athletes by regulating the participation of national teams in various types of commercial competitions, thereby increasing the strategic importance of preparation for the Olympic Games and World Championships.



**Fig. 1. Ratio of medals won by women’s national volleyball teams based on performance in the Olympic Games (a) and World Championships (b) from 1992 to 2022, %:**  
 ■ – Brazil; ■ – USA; ■ – China; ■ – Cuba; ■ – Serbia; ■ – Japan; ■ – Italy.

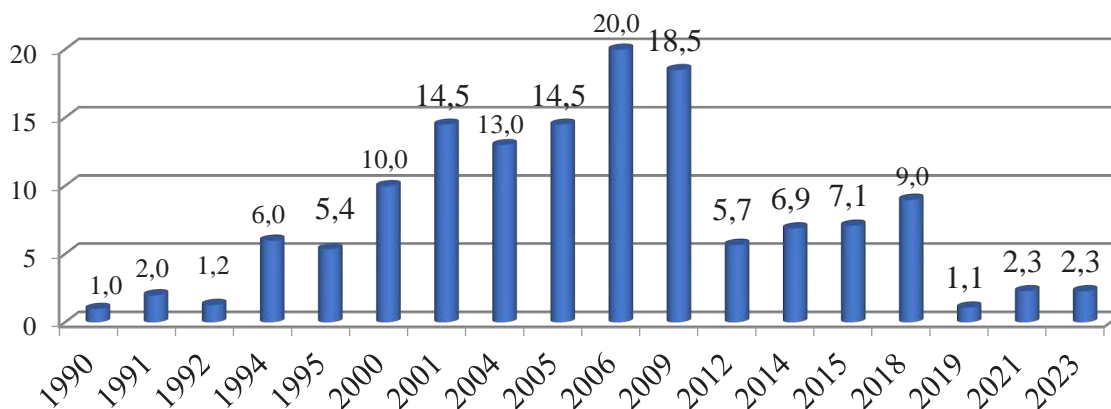
The professionalization of modern volleyball has significant differences. Whereas basketball has seen the creation of separate structures for Olympic and professional sports, volleyball has seen these processes take place within the Olympic framework, which involves the participation of athletes in official competitions and the largest commercial events (World League and Nations League) managed by the International Volleyball Federation. The World League began in 1990 and, as part of the regulations of the International Volleyball Federation, was the first tournament of the season for national teams of the world. The competition consisted of preliminary (intercontinental) and final rounds. Teams that had the necessary financial conditions and television broadcasts of home rounds were allowed to participate in the World League [11; 21]. It was in the World League that in 1990 there were changes in the calculation of points for a winning game, where the main algorithm was the “Italian system” (three points were awarded to the team that won with a score of 3:0 and 3:1; two points for a win and one point for a loss – with a score of 3:2).

It is interesting to analyze commercial starts, which include the World League (men’s) and World Grand Prix (women’s) tournaments, as shown in Figure 2.

The analysis of the study shows that the number of participating teams in these competitions has been steadily increasing over the history of their existence, which has led to an

increase in the prize fund. The largest financial reward was received by the winning team in 2006 (USD 20 million), and the maximum number of participating teams was observed from 2015 to 2018 (USD 36). For example, in 2007, the structure of the World League consisted of 112 games in 46 countries with the participation of 16 teams, which were divided into 4 groups according to the geographical principle. Since 2018, the World League has been renamed by the International Volleyball Federation in the calendar as the Nations Volleyball League, which ensures the simultaneous participation of men’s and women’s teams in the world. It was this series of commercial starts that became controlling in the macrocycle, which can solve the main tasks of the training process. On the other hand, it is significantly exhausting, which can lead to a decrease in the level of players’ performance and negatively affect the effectiveness of the players’ competitive activity.

A striking example of this is the Polish men’s national team, which won the World League in 2012, which led to a negative performance in the 2012 London Olympics, finishing fifth. On the women’s side, the Italian national team won silver medals at the World Grand Prix in 2004, but did not medal at the Olympic Games held in Athens. Therefore, based on the information obtained, it becomes obvious that at the present stage of volleyball development, there is a gradual decrease in the importance of the results of official international competitions



**Fig. 2. Dynamics of World League prize pools in the period from 1990 to 2023 (from 2019 Volleyball Nation League)**

(Olympic Games, World Championships), which significantly affects the process of training national team athletes in the Olympic cycle.

The clear leader in women’s volleyball is the Brazilian national team, which has the highest results in the Olympic Games (5 medals) and World Championships (5 medals), which it won between 1991 and 2023. According to the FIVB rankings in 2023, the Brazilian women’s national team is ranked 3rd, behind only Turkey and the United States. The beginning of high sports achievements in the Olympic Games of the Brazilian women’s national team began in 1994 with the appointment of Bernardinho as coach, who immediately led the team to victory in the World Grand Prix and won bronze medals in 1996 and 2000. He was replaced by Ze Roberto in 2003, under whose leadership the team won gold medals in 2008 and 2012. One of the peculiarities of the training of female athletes is the interconnection of the Brazilian and European training systems, which consisted, on the one hand, of increasing the intensity and volume of training work in the macrocycle, which allowed to increase the level of special physical abilities, and, on the other hand, of the formation of tactical systems of play, especially defense.

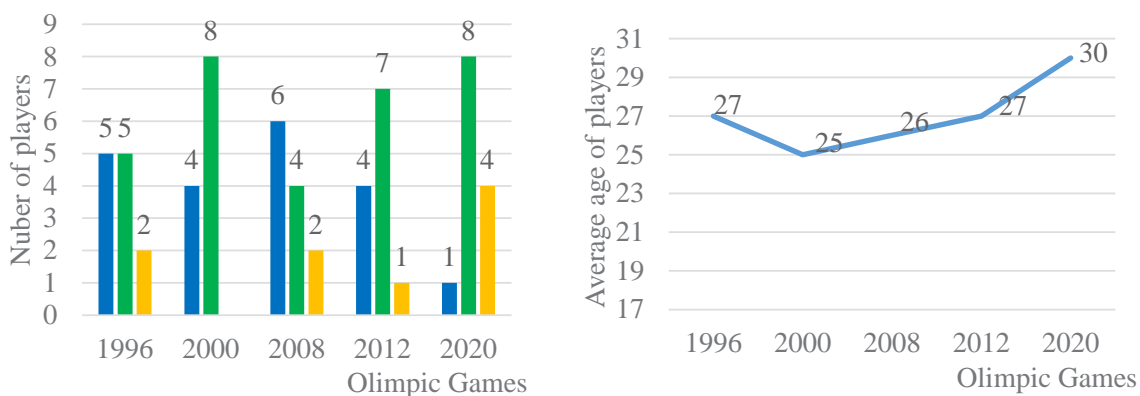
Bernardinho and Ze Roberto believed that the main factor that influenced the formation of the starting line-up at the level of the Brazilian national team was, firstly, the player’s playing

experience; secondly, the need for specialized abilities that are inherent in certain playing roles (for example, for link-up players, the most important ability should be stability, emotional balance, and congruent functions; for attacking players, psychological compatibility and a close relationship with the link-up player); and thirdly, the search for talented players in order to unlock their potential.

Figure 3 shows the age ratio of the Brazilian national volleyball team based on the results of their performances in the Olympic Games and World Championships from 1996 to 2020.

In different periods of the development of women’s Brazilian volleyball, it can be noted that the formation of the team was carried out on the principle of selecting a larger number of athletes aged 26 to 31 years, which, when compared with men’s teams, has some differences associated with the peculiarities of the physiological processes of the female body. There is a tendency to increase the age of female athletes. The largest number of female athletes over the age of 30 were registered in the 2020 Olympic Games, where the maximum age was Tandara Kaysheta (41) and Karol Gattas (39). There is also a tendency to select female athletes aged 26 to 31 for the national team, with the largest number of them being recorded at the 1996 and 2020 Olympic Games.

One of the main criteria for the formation of national teams in volleyball is the performance



**Fig 3. The age of the athletes of the Brazilian women’s national volleyball team based on the results of their performances at the Olympic Games from 1984 to 2020:**  
■ – 20–25 years; ■ – 26–31 years; ■ – 32 years and older

of the players' competitive activity, taking into account their playing roles [2; 7; 21]. However, the selection criteria for players of different roles have certain differences, which consist in the performance of certain technical and tactical actions by players. In this regard, it is necessary to analyze the parameters of competitive activity of players of different roles in volleyball, which will allow us to determine the criteria of technical and tactical preparedness in the formation of national teams [15]. Table 1 presents the parameters of competitive activity of volleyball players of different game amplitudes according to the results of performance in the most prestigious modern international competitions in Nation League in 2023.

The results of the analysis of the competitive activity of volleyball players show that sportswomen of different game roles have certain differences in the effectiveness of technical and tactical actions. The most versatile in technical and tactical training are outside hitters, where the main criterion is the effectiveness of

attacking strokes (the maximum value is 49.8%) and defensive actions (68.2%). Players of this position are mostly universally trained and can also perform the functions of another position, which is a consequence of performing almost all game actions (they also pass the ball, but this technique is not effective for any position except the link player due to its performance with regard to attacking tactics). The selection of opposing spiker players is also based on the effectiveness of attacking strokes. The evolution of the rules of volleyball has led to the development of tactical systems for the game, which has increased the importance of players in this game. If in the 1980s the opposite spiker performed the function of a link player in some game moments, nowadays, along with the outside hitter, it is the main attacking potential of the team. A striking example is the Cuban athlete of the Turkish national team, Melissa Vargas, who performed 54.3% of effective attacking shots and 13.1% of serves, which confirms the importance of reliable attacking actions for the selection of players for

Table 1

**Performance indicators of the world's leading volleyball players of different playing roles according to the results of the Volleyball League of Nations in 2023**

Volley-ball players	Winning technical and tactical actions											
	Serve		Setter		Attack		Block		Receiver		Digger	
	X±S	E, %	X±S	E, %	X±S	E, %	X±S	E, %	X±S	E, %	X±S	E, %
<b>Outside hitter</b>												
Li Y.Y.	3±3.2	5.7	–	–	37±5.5	49.8	2±1.7	1.0	13±2.4	33.3	14±6.6	66.0
Gray	2±5.2	5.4	–	–	29±2.4	40.3	3±4.5	1.1	10±5.5	15.0	15±2.8	68.2
Orth-mann	2±2.5	10.9	–	–	28±6.7	41.3	2±3.5	0.9	8±3.2	30.2	12±5.2	66.4
<b>Opposite spiker</b>												
Vargas	3±5.3	13.1	–	–	27±2.4	54.3	2±8.6	1.2	–	–	12±5.5	69
Stysiak	1±8.2	4.0	–	–	37±4.4	45.0	4±5.3	2.4	–	–	18±2.6	68.3
Nwakalor	2±1.3	1.6	–	–	30±6.3	45.0	5±9.2	2.5	–	–	13±1.2	62.5
<b>Middle blocker</b>												
Korneluk	3±3.3	5.7	–	–	16±3.6	59.3	7±6.7	3.2	–	–	6±5.5	51.6
Gunes	1±8.4	2.0	–	–	7±2.8	54.8	6±5.2	3.0	–	–	4±1.6	48.9
Erdem	2±2.8	3.6	–	–	5±1.7	56.2	6±8.3	2.8	–	–	7±2.3	77.6
<b>Setter</b>												
Diao L.Y.	2±3.4	4.7	46±6.3	24.9	8±2.5	32.0	2±1.5	0.8	–	–	13±6.6	62.2
Wenerska	1±6.4	2.8	33±3.3	18.1	6±4.2	33.3	1±2.6	0.6	–	–	19±7.4	62.4
Brie	2±3.5	3.8	38±6.4	21.7	18±1.1	41.8	2±4.5	0.9	–	–	16±3.5	67.0
<b>Libero</b>												
Stenzel	–	–	1	0.8	–	–	–	–	12±1.4	31.3	25±1.3	72.0
Štimac	–	–	–	–	–	–	–	–	11±3.5	35.6	23±2.2	72.4
Pogany	–	–	1	0.7	–	–	–	–	10±2.3	30.4	24±3.1	63.5

this role in the national teams. Middle blockers perform the largest number of blocks during the competition. Due to the fact that the general statistics reflect only the number of blocks won, this indicator should not exceed the technical and tactical actions of other game roles. For example, the leader among the best blockers is the Polish volleyball player Korneluk, who averaged 200 blocks in one game during her performance in the 2023 Nation League, of which 16 were winners. At the same time, the effectiveness of attacking strokes remains an important criterion, and the highest rate for this athlete is also 59.3%. The main function of a setter is to make passes to enable players to implement an attacking plan, which is tactically oriented and crucial for the selection of players for national teams. The evaluation of Setter's competitive performance is based on determining the number of fronts in front of the ball when performing an attacking shot in the following variations: without a block and in interaction with one blocking player.

The player with the player with the highest passing efficiency is L.Y. Diao, a volleyball player for the Chinese national team, who made 322 passes that led to the winning of the ball with an efficiency rate of 30%. There is also a tendency for the setter to perform attacking strokes, which is highly effective in competition due to the unexpectedness of these actions. The highest efficiency of attacking strokes (41.8%) is observed in the competitive activity of the volleyball player of the Canadian national team, Brie, which allowed the given indicator. The highest efficiency of attacking strokes (41.8%) is observed in the competitive activity of the volleyball player of the Canadian national team, Brie, which allowed her to take a place in the ranking among the best setters by this indicator.

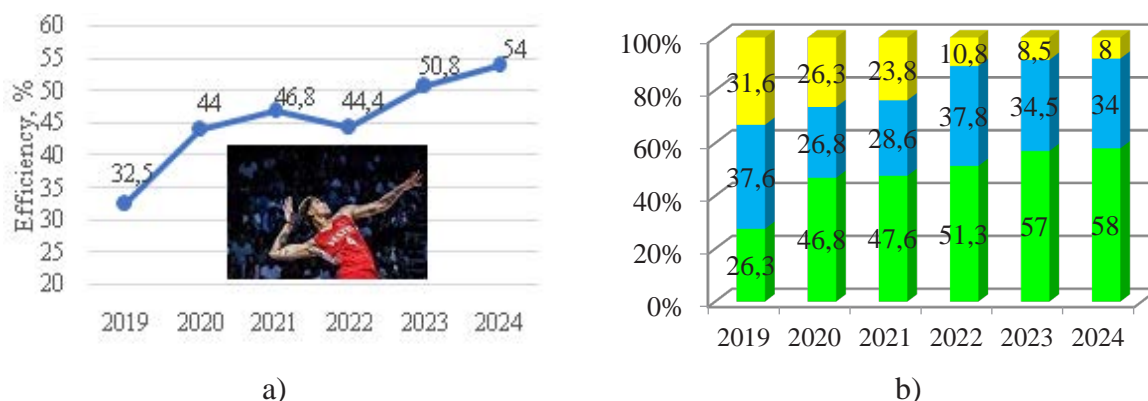
A characteristic feature of the competitive activity of libero players is the performance of the largest number of serve receptions and the performance of technical and tactical actions in defense (receiving attacking shots and insurance against the block). The highest number of successful defensive actions is observed in the Croatian volleyball player Štimac, who performed 72.4% of effective technical and

tactical actions in defense and 35.6% in receiving the serve. Modern world trends in volleyball competition confirm the need to involve libero players in the execution of ball passes made to attacking players. Thus, during her performance at Nation League in 2023, the Polish libero Stenzel made the largest number of passes (167) aimed at performing attacking shots, but only one pass was a winning one, which is explained by the lack of organization of attacking tactics, which leads to the timely construction of group defensive actions by the opponent.

The results of the analysis of the competitive activity of volleyball players of different playing roles of the world's leading national teams show that when forming teams, considerable attention is paid to the individual characteristics of players, their height and age characteristics. Studies show that the requirements for players of different roles have their own significant differences, which is reflected in the specifics of their competitive activity and the determination of its priority areas. This is especially true for players of the attacking plan, where the high implementation of attacking shots is compensated by the low efficiency of defensive actions. That's why modern volleyball is now seeing the emergence of players with unique attributes. A striking example is Cuban volleyball player Melissa Vargas, who plays for the Turkish national team and was named the world's best volleyball player in 2023. Figure 4 shows the dynamics of the effectiveness of her competitive activity in the period from 2019 to 2023.

The research results show that there is currently a tendency in volleyball to a significant rejuvenation of women's national teams, which is a consequence of the accentuated training of the nearest reserve by selecting talented and unique players with high potential and matching their training to the chosen playing role. The research results show that there is currently a tendency in volleyball to a significant rejuvenation of women's national teams, which is a consequence of the accentuated training of the nearest reserve by selecting talented and unique players with high potential and matching their training to the chosen playing role. In the period from 2019 to 2024, the efficiency of competitive activity





**Fig. 4. The dynamics of the effectiveness of Melissa Vargas's (Turkey) competitive activity according to the results of official international competitions (a), parameters of attacking actions (b) in relation to: ■ – winning balls; ■ – balls that remained in the game after the execution of attacking actions; ■ – errors**

of diagonal player Melisa Vargas has a gradual increase, where the highest value is in 2023 – 54%. Also, this period of analysis is characterized by the participation of the volleyball player not only in the Turkish national team in official competitions (Nations League, European Championships, World Championships), in international club competitions (Champions League) and in the national championship. The analysis of competitive activity shows that the main criterion of diagonal players' preparedness is the efficiency of attack, as well as the ratio of won, lost and remaining in the game balls. Thus, in the period from 2019 to 2024, the dynamics of attack efficiency is observed, where the maximum value is 58%. At the same time, there is a decrease in the volume of errors from 31.6% in 2019 to 8.0% in 2024, which is confirmed by the peculiarities of the formation of sportsmanship in team game sports. The obtained results indicate that today in modern volleyball there is a tendency to select players with a high level of technical and tactical preparedness in the national team, where the main criterion is the stability of the performance of offensive and defensive actions, which allowed the women's national team of Turkey to win the gold medals of the League of Nations, European Championship 2023, taking the first place in the FIVB ranking.

In the period from 2019 to 2024, the efficiency of competitive activity of diagonal player Melisa Vargas has a gradual increase, where the highest value is in 2023 – 54%. Also,

this period of analysis is characterized by the participation of the volleyball player not only in the Turkish national team in official competitions (Nations League, European Championships, World Championships), in international club competitions (Champions League) and in the national championship. The analysis of competitive activity shows that the main criterion of diagonal players' preparedness is the efficiency of attack, as well as the ratio of won, lost and remaining in the game balls. Thus, in the period from 2019 to 2024, the dynamics of attack efficiency is observed, where the maximum value is 58%. At the same time, there is a decrease in the volume of errors from 31.6% in 2019 to 8.0% in 2024, which is confirmed by the peculiarities of the formation of sportsmanship in team game sports. The obtained results indicate that today in modern volleyball there is a tendency to select players with a high level of technical and tactical preparedness in the national team, where the main criterion is the stability of the performance of offensive and defensive actions, which allowed the women's national team of Turkey to win the gold medals of the League of Nations, European Championship 2023, taking the first place in the FIVB ranking.

#### **Discussion.**

The necessary prerequisites for ensuring the effectiveness of competitive activity in volleyball are the analysis of current global trends, which are due to the processes of professionalization, commercialization, and globalization. The

main criterion that determines the level of development of sport in a particular country is high achievements in the most important official international competitions led by the FIVB: the Olympics, World Championships, and the Volleyball Nation League (World League) [11]. It is the definition of leadership positions that take place in modern volleyball that makes it possible to identify volleyball development centers in the world based on the functioning of international training centers, factors that affect the effectiveness of competitive activity, and the peculiarities of team formation by players of different playing roles.

The conducted research allowed us to determine that since the 1990s, there has been a change of leaders in world volleyball, which has led to the effectiveness of the training system in the leading countries of the world. First of all, it concerns the planning and organization of a long-term training system. Secondly, there was a search for gifted athletes with distinct individual characteristics, i.e., unique players. Thirdly, the selection of national teams was based on playing experience or the number of Olympic cycles a particular player had completed. All of this has had a significant impact on the training of high-class volleyball players in countries such as Brazil (three gold and two silver medals at the Olympic Games, three gold, two silver, and one bronze at the World Championships; 10 gold, 7 silver, and four bronze in the World League (Nation League); Italy (three silver and three bronze at the Olympic Games; three gold medals at the World Championships; 8 gold, three silver, and four bronze medals in the World League (Nation League); and the and the USA (one gold and two bronze medals at the Olympic Games; one bronze medal at the World Championships; two gold, three silver, and four bronze medals in the World League (Nation League). This is a consequence of the formation of new global trends in these countries, such as increasing the importance of specialized requirements for players of different playing roles; improving the technical and tactical training of athletes and organizing a high-speed style of play; expanding the means of innovative technologies that ensure

the effectiveness of training in the macrocycle and effective management of competitive activities; popularizing volleyball through the involvement of the media and the Internet; and increasing the audience in offline.

Under the influence of professionalization and globalization, positive changes have taken place in the formation of national teams, taking into account the age and professional experience of the players. One of the most important factors affecting the effectiveness of the modern training system in volleyball is the number of Olympic cycles that a player has spent as a member of the national team and his or her reserve capabilities, which are confirmed by the data of leading experts in the general theory of athletes' training [13; 14]. This approach allows for the preservation of the main team composition by systematically selecting its rotational composition, which allows for effective team formation in each Olympic cycle. This trend began to be observed in 1992 at the Olympic Games, when the Brazilian women's national team included volleyball players who had completed three Olympic cycles (1992, 1996, and 2000): Leila Barros and Elia Rogerio de Sousa Pinto. This trend continues to this day on the US national team. Thus, Jordan Larson-Burbank and Foluke Akinradewo have also completed three Olympic cycles (2012, 2016, and 2020).

A significant expansion of world competition in volleyball has led to the formation of requirements concerning the preparedness of players of different game roles, where the central place is occupied by the effectiveness of their competitive activity, taking into account individual capabilities [16; 18; 19]. The main criterion for the players of the attacking plan is a high level of implementation of attacking actions, which is different for each game role due to the universalization of individual technical and tactical actions. According to the analysis of the competitive activity of volleyball players of different game roles, according to the results of the VNL 2023, the most important factor for an outside hitter is high efficiency of attack, serve, and defensive actions. The relatively low efficiency of attacking strokes is compensated

by the highest efficiency of defensive actions among other playing roles (except libero). The best opposite spikers have the highest efficiency of attacking actions (attacking stroke and serve), which is compensated by the low efficiency of defensive actions. It should also be noted that the players in this position have the maximum height on the team (Melissa Vargas, 194 cm, Magdalena Stysiak, 203 cm), which allows them to attack past the block [14]. The attack efficiency for the middle blocker should be at least 50 percent and the block efficiency should be 3 percent, which will provide certain criteria for selection for the starting line-up. For a setter, the main criterion is the effectiveness of ball passes for attacking. But when analyzing competitive activity, one should take into account the speed of passes when using group tactical actions in attack and the number of attacks by players performed in interaction with or without one blocking player. There is also a tendency to perform a small number of attacking shots, which are winning in cases of at least 32.0%. The competitive activity of the best liberos is characterized by the highest efficiency of defensive actions (72.0%), which can be a determining factor in the formation of the main composition of national teams in volleyball.

### Conclusions.

1. At the present stage, the development of team-game sports, including in volleyball, is impossible without taking into account the processes of globalization, which are implemented through the expansion of the system of international competitions, their politicization and socialization, increasing commercial launches, the concentration of the strongest athletes in the world's leading leagues, further professionalization of athletes in the club and international system, and general informationalization of society. Of particular importance is the participation of athletes in the Olympics and World Championships, which determines the country's image at the international level, promotes a healthy lifestyle, and consolidates international society through the exchange of cultural values.

2. Analysis of the results of women's national volleyball teams' performances in the Olympic

Games and World Championships has revealed that today the leaders are the teams of Brazil (20.8%), the USA (16.7%), and China (16.7%), which confirms the development of volleyball on the South American, North American, and Asian continents. It is the focus on the system of training players in these countries and the specifics of forming teams for official international competitions that will increase the efficiency of competitive activity.

3. The use of modern world experience in the rational formation of the composition of women's national volleyball teams has made it possible to establish that an integral component is the age of the players, their professional experience on the national team, and the presence of universal abilities to perform several game roles. At this stage of volleyball's development, there is a tendency to increase the age of female athletes involved in national teams, which ensures effective rotation over several Olympic cycles.

4. The implementation of modern training of athletes in team game sports (women's national volleyball teams) should be based on the successful performance of athletes in official international competitions, where the main ones are the Olympic Games, World Championships, and major continental ones, focusing on the universal actions of players and the current areas of training of athletes of different roles and players of the rotational composition of teams, which will allow for the effective formation of national teams.

The prospect of further research is to analyze the migration of players as the main factor in the effective formation of teams in team sports in the context of globalization.

### Bibliography

1. Борисова О., Шутова С., Нагорна В., Шльонська О., Серебряков О., Мітько А. Характеристика змагальної діяльності збірних команд України зі спортивних ігор на міжнародній арені. *Спортивна наука та здоров'я людини*. 2020. № 2(4). С. 15–22. <https://doi.org/10.28925/2664-2069.2020.2.3>.

2. Борисова О., Дутчак М., Шльонська О. Аналітичний огляд наукових досліджень за проблемою підготовки спортсменів різних ігрових амплуа в командних ігрових

видах спорту. *Спортивна наука та здоров'я людини*. 2024. № 1(11). С. 39–57. <https://doi.org/10.28925/2664-2069.2024.14>.

3. Кириленко О.М. Розвиток інституту спорту в умовах глобалізації. *Інформаційний вісник НТУУ «КПІ». Політологія. Соціологія. Право*. 2010. № 4(8). С. 48–53.

4. Сушко Р., Дорошенко Е. Технологія підготовки збірних команд у спортивних іграх з урахуванням чинників міграції. *Спортивний вісник Придніпров'я*. 2019. № 3. С. 68–77. <https://doi.org/10.32540/2071-1476-2019-3-068>.

5. Хіменес Х., Пітін М., Дмитренко А. Особливості сучасних систем змагань у баскетболі (на прикладі NBA та професійних турнірів під егідою FIBA). *Спортивні ігри*. 2020. № 1(15). С. 85–94. <https://doi.org/10.15391/si.2020-1.08>.

6. Шинкарук О., Дутчак М., Павленко Ю. Олімпійська підготовка спортсменів в Україні: проблеми і перспективи. *Спортивний вісник Придніпров'я*. 2013. № 1. С. 82–86.

7. Шинкарук О. Пошук та розвиток спортивного таланту: ретроспективний та сучасний аналіз. *Теорія та методика фізичного виховання*. 2020. № 2. С. 47–58. DOI: 10.32652/tmfvs.

8. Alonso B.J. & Giambattista R. The Influence of PROFUT Regulation on Brazilian Football Clubs Earnings Quality. *Book of Abstracts – The 14th ESEA Conference on Sport Economics*. 2023, 21 p.

9. Bradshaw H., Howells K., Lucassen M. Abandoned to manage the post-Olympic blues: Olympians reflect on their experiences and the need for a change. *Qualitative Research in Sport, Exercise and Health*. 2021. P. 1–18. <https://doi.org/10.1080/2159676X.2021.1993974>.

10. Gaenssle S. & Feddersen A. Economics of Superstars in Basketball: An Empirical Analysis of WNBA and NBA. *Book of Abstracts – the 14th ESEA Conference on Sport Economics*. 2023, 79 pp.

11. Fellingham G.W. Evaluating the performance of elite level volleyball players. *Journal of Quantitative Analysis in Sports, De Gruyter*. 2022. Vol. 18(1). P. 15–34. <https://doi.org/10.1515/jqas-2021-0056>.

12. Kostiukevych V., Imas Ye., Borysova O., Dutchak M., Shynkaruk O., Kogut I. et al. Modeling of the athletic training process in team sports during an annual macrocycle. *Journal of Physical Education and Sport*. 2018.

Vol. 18(1). P. 327–334. <https://doi.org/10.7752/jpes.2018.s144>.

13. Kostiukevych V.M. Model indicators of collective interactions of highly qualified football players during the game. *Health, Sport, Rehabilitation*. 2019. Vol. 5(4). P. 33–40. <https://doi.org/10.34142/HSR.2019.05.04.04>.

14. Kostiukevych V., Shchepotina N., Shynkaruk O., Kulchytska I., Borysova O., Dutchak M., Vozniuk T. et al. Training process construction of the qualified volleyball women players in the preparatory period of two-cycle system of the annual training on the basis of model training tasks. *Journal of Physical Education and Sport*, 2019. Vol. 19(2). P. 427–435. <https://doi.org/10.7752/jpes.2019.s2063>.

15. Kozina Z., Polishchuk D., Polishchuk S. Integral testing indicators individual features of various playing volleyball players at the specialized basic training stage. *Health Technologies*. 2023. Vol. 1(2). P. 6–21. <https://doi.org/10.58962/HT.2023.1.2.6-21/>.

16. Miller T. Globalization and sport: playing the world. 2001, 160 p.

17. Marković S., Čuk I., Živković A. The impact of information technologies on the scouting process in sports games. *International scientific conference on information technology and data related research*. 2020. P. 240–245. <https://doi.org/10.15308/Sinteza-2020-240-245/>.

18. Nalbantis G. & Kühne P. Substitution effects and the demand for over-the-top sports broadcasts – The case of German Volleyball. *Book of abstracts – The 14th ESEA Conference on Sport Economics*. 2023, 83 p.

19. Sarafinjuk L.A., Khapitska O.P., Fedoniuk L.Ya., Fomina L.V., Merkulova D.A., Kyrychenko Yu.V. et al. The peculiarities of the body's external structure and indicators of central hemodynamics of volleyball players of different positions. *Wiadomości Lekarskie*, 2021. Tom LXXIII, No 5. P. 920–924. <https://doi.org/10.36740/WLek202005115>.

20. Smith-Ditizio A. & Smith, A.D. Olympic Games, media coverage and brand image performance from fan and gender perspectives. *Benchmarking: An International Journal*. 2023. Vol. 30(2). P. 503–531. <https://doi.org/10.1108/BIJ-02-2022-0117>.

21. Taylor B., & Garratt D. The professionalisation of sports coaching: relations of power, resistance and compliance. *Sport, Education and Society*. 2010. Vol. 15(1). P. 121–139. <https://doi.org/10.1080/13573320903461103>.

## References

1. Borysova, O., Shutova, S., Nahorna, V., Shl'ons'ka, O., Serebryakov, O., Mit'ko A. (2020). Kharakterystyka zmahal'noyi diyal'nosti zbirnykh komand Ukrainy zi sportyvnykh ihor na mizhnarodniy areni [Characteristics of competitive activity of Ukrainian national teams in sports games in the international area]. *Sportyvna nauka ta zdorov'ya lyudyny – Sport Science and Human Health*, 2(4), 15–22. <https://doi.10.28925/2664-2069.2020.2.3> [in Ukrainian].
2. Borysova, O., Dutchak, M., Shl'ons'ka, O. (2024). Analitychnyy ohlyad naukovykh doslidzhen' za problemoyu pidhotovky sportsmeniv riznykh ihrovykh amplua v komandnykh ihrovykh vydakh sportu [Analytical review of modern scientific research on the problem of training sportsmen of different game employment in command game sports]. *Sportyvna nauka ta zdorov'ya lyudyny – Sports science and men's health*, 1(11), 39–57. <https://doi.org/10.28925/2664-2069.2024.14> [in Ukrainian].
3. Kyrlyenko, O.M. (2010). Rozvytok instytutu sportu v umovakh hlobalizatsiyi [Development of the institution of sports in the minds of globalization]. *Informatsiynyy visnyk NTUU "KPI". Politolohiya. Sotsiolohiya. Pravo. – Newsletter of NTUU "KPI". Political science. Sociology. Law*, 4(8), 48–53 [in Ukrainian].
4. Sushko, R., Doroshenko, E. (2019). Tekhnolohiya pidhotovky zbirnykh komand u sportyvnykh ihrakh z urakhuvannyam chynnykiv mihratsiyi [Technology of preparing national teams for sports games with the regulation of migration officials]. *Sportyvnyy visnyk Prydniprov'ya – Sports newsletter of the Dnieper region*, 3, 68–77. <https://doi.10.32540/2071-1476-2019-3-068> [in Ukrainian].
5. Khimenes, Kh., Pitin, M., Dmytrenko, A. (2020). Osoblyvosti suchasnykh system zmahany' u basketboli (na prykladi NBA ta profesiynykh turniriv pid ehidoyu FIBA) [Peculiarities of current systems in basketball (in the case of NBA and professional tournaments under FIBA)]. *Sportyvni ihry – Sports games*, 1, 85–94. <https://doi:10.15391/si.2020-1.08> [in Ukrainian].
6. Shynkaruk, O., Dutchak, M., Pavlenko, Yu. (2013). Olimpiys'ka pidhotovka sportsmeniv v Ukraini: problemy i perspektyvy [Olympic training of athletes in Ukraine: problems and prospects]. *Sportyvnyy visnyk Prydniprov'ya – Sports newsletter of the Dnieper region*, 1, 82–86 [in Ukrainian].
7. Shynkaruk, O. (2020). Poshuk ta rozvytok sportyvnoho talantu: retrospektyvnyy ta suchasnyy analiz [Finding and developing athletic talent]. *Teoriya ta metodyka fizychnoho vykhovannya – Theory and methodology of physical education*, 2, 47–58. DOI: 10.32652/tmfvs. [in Ukrainian].
8. Alonso, B.J. & Giambattista, R. (2023). The Influence of PROFUT Regulation on Brazilian Football Clubs Earnings Quality. *Book of Abstracts – The 14th ESEA Conference on Sport Economics*, 21.
9. Bradshaw, H., Howells, K., Lucassen, M. (2021). Abandoned to manage the post-Olympic blues: Olympians reflect on their experiences and the need for a change. *Qualitative Research in Sport, Exercise and Health*. 1–18. <https://doi.org/10.1080/2159676X.2021.1993974>.
10. Gaenssle, S. & Feddersen, A. (2023). Economics of Superstars in Basketball: An Empirical Analysis of WNBA and NBA. *Book of Abstracts – the 14th ESEA Conference on Sport Economics*, 79.
11. Fellingham, G.W. (2022). Evaluating the performance of elite level volleyball players. *Journal of Quantitative Analysis in Sports, De Gruyter*, 18(1), 15–34. <https://doi.10.1515/jqas-2021-0056>.
12. Kostiukevych, V., Imas, Ye., Borysova, O., Dutchak, M., Shynkaruk, O., Kogut, I. et al. (2018). Modeling of the athletic training process in team sports during an annual macrocycle. *Journal of Physical Education and Sport*, 18(1), 327–334. <https://DOI:10.7752/jpes.2018.s144>.
13. Kostiukevych, V.M. (2019). Model indicators of collective interactions of highly qualified football players during the game. *Health, Sport, Rehabilitation*, 5(4), 33–40. <https://doi.10.34142/HSR.2019.05.04.04>.
14. Kostiukevych, V., Shchepotina, N., Shynkaruk, O., Kulchytska, I., Borysova, O., Dutchak, M. et al. (2019). Training process construction of the qualified volleyball women players in the preparatory period of two-cycle system of the annual training on the basis of model training tasks. *Journal of Physical Education and Sport*, 19(2), 427–435. <https://doi.10.7752/jpes.2019.s2063>.
15. Kozina, Z., Polishchuk, D., Polishchuk, S. (2023). Integral testing indicators individual features of various playing volleyball

players at the specialized basic training stage. *Health Technologies*, 1(2), 6–21. <https://doi.org/10.58962/HT.2023.1.2.6-21/>.

16. Miller, T. (2001). Globalization and sport: playing the world, 160.

17. Marković, S., Ćuk, I., Živković, A. (2020). The impact of information technologies on the scouting process in sports games. *International scientific conference on information technology and data related research*, 240–245. <https://doi.org/10.15308/Sinteza-2020-240-245/>.

18. Nalbantis, G. & Kühne, P. (2023). Substitution effects and the demand for over-the-top sports broadcasts – The case of German Volleyball. *Book of abstracts – The 14th ESEA Conference on Sport Economics*, 83.

19. Sarafinjuk, L.A., Khapitska, O.P., Fedoniuk, L.Ya., Fomina, L.V., Merkulova, D.A., Kyrychenko, Yu.V., et al. (2021). The peculiarities of the body's external structure and indicators of

central hemodynamics of volleyball players of different positions. *Wiad Lek*, LXXIII. 2021, 5, 920–924. <https://doi:10.36740/WLek202005115>.

20. Smith-Ditizio, A. & Smith, A.D. (2023). Olympic Games, media coverage and brand image performance from fan and gender perspectives. *Benchmarking: An International Journal*, 30(2), 503–531. <https://doi.org/10.1108/BIJ-02-2022-0117>.

21. Taylor, B., & Garratt, D. (2010). The professionalisation of sports coaching: relations of power, resistance and compliance. *Sport, Education and Society*, 15(1), 121–139. <https://doi.10.1080/13573320903461103>.

Прийнято: 24.09.2024

Опубліковано: 31.10.2024

Accepted on: 24.09.2024

Published on: 31.10.2024