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**Original Article**

# Influence of psychophysiological factors on the effectiveness of competitive activity of volleyball players (girls) aged 16 to 18

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**Abstract.**
To determine the influence of indicators of psychophysiological functions and typological features of the nervous system on the effectiveness of competitive activity of volleyball players (girls) aged 16 to 18. The study involved 18 volleyball players (girls) aged 16 to 18. Significant influence of indicators of sensorimotor, proprioceptive, perceptual and intellectual functions on the efficiency of volleyball players' (girls') competitive activity at the stage of preparation for higher achievements was established. The average correlation was found between the efficiency of ball reception after submission and the speed of information processing, the ability to distribute attention, the assessment of muscular efforts, strength and mobility of nervous processes. Reliable relationships were found between the effectiveness of volleyball players (girls') defensive actions and the speed of switching attention, the speed of motor responses. The performance of volleyball players (girls) has significant positive relationships with the speed and quality of operational thinking, the ability to differentiate movement parameters and response choices, and the mobility of the nervous system. The average level of interrelationship is found between the effectiveness of opponent's blocking spikes and the volleyball players' (girls') mental processes, attention switching speed, muscular efforts differentiation, complex reaction of choice. Reliable correlations were found between the quality of ball delivery and the speed of thinking, the ability to kinesthetic sensations, the balance of nervous processes. Typological features of the volleyball players' nervous system determine the nature of their behaviour in the process of competitive activity, reflected in the characteristics of their game situation assessment and in the decision-making nature. Taking into account the temperament type will allow the trainer to take an individual approach to each athlete and make timely adjustments to the training process.
**Key words: volleyball, girls, function, competitions, abilities, perception, correlation**

## Introduction

Modern volleyball requires by high motor activity of volleyball players (girls). Effective performance of jumping games, techniques and most tactical combinations in one game or in several playing days is based on the high level of athletes' physical qualities. Much attention is paid to players' athleticism in preparation for competitions (Trajkovic, Kristicevic, & Sporis, 2017; Fathi et al. 2019). In connection with the improvement of athleticism in attack tactics, a high-speed attack prevails with an increase in such motor components as coordination and accuracy of movements. Nevertheless, according to (Popkov, 2017; Pavlenkovich, Bespalova, Tokaeva, & Smyshlyaeva, 2018), in order to achieve high efficiency of volleyball competitive activity, the main requirements are placed on the central nervous system of volleyball players. In this regard, there is an urgent requirement to improve the effectiveness of the players' psychological preparation. Indeed, at this time, volleyball reached such a level of development that the physical, technical, tactical preparedness of the players are at approximately the same level. Therefore, the competition result is determined to a large extent by psychophysiological factors.

As noted by Koryahin and Blavt (2019), peripheral vision and eye accuracy are well developed as one of the factors of high technical and tactical skills of volleyball players (gils). This allows players to cope well in difficult game situations, to be able to see the position and movement of players on the court, to control the continuous ball movement. According to experts, developed peripheral vision is an essential factor for game victory. Since highly developed peripheral vision in combination with excellent technical preparedness of the players is the basis of the athletes' tactical skill.

Boichuk et al. (2018) and Surina-Marysheva et al. (2019) indicate a high emotional and intellectual richness in sports and volleyball in particular. Assessing the distance between the players during the execution of


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techniques is one of the important psychological characteristics of the motor skills of volleyball players (girls). All this is related to the development of visual motor coordination, very accurate and differentiated spatial, temporal perceptions and musculoskeletal sensations. Kinesthetic sensitivity is one of the main components of such a complex specialized perception as "ball sense". Experts note the close relationship between the achievement of high results in volleyball and the ability of players to perform complex techniques in unusual positions. This in a certain way depends on the vestibular stability of the athlete. According to experts, the use of complex coordination exercises for training the vestibular apparatus of volleyball players (girls) will significantly increase the effectiveness of game defense and attack.

Analysis of studies conducted by (Zhelezniak, Portnov, & Savin, 2001; Khan, Khan, Arif, & Khan, 2019) show that the success of the technical and tactical actions of volleyball players (girls) is determined to a large extent by a high level of attention development. Researchers distinguish such properties of attention as span, intensity, stability, distribution, switching. The volleyball player's attention span is characterized by the perception of a large number of objects (ball, partner, opponent, etc.). Volleyball game requires very intense attention during the match. Therefore, players shall possess a high level of attention intensity and stability throughout the match. Another important feature of attention for a volleyball player is its switching. In volleyball, increased demands are placed on the speed of switching attention. This, according to experts, is associated with the need to alternately and quickly move central vision to the ball. And also quickly move from defensive to attack actions. High demands are placed on the attention distribution. This is necessary for the simultaneous successful execution of several activities. Since volleyball players shall determine the distance to the ball and to the players, monitor the movement of their partners and players of the opposing team, choose the method of ball passing.

Koçak (2019) and Rogowska (2020) point out the important role of creative thinking in successfully solving tactical problems during a game match. In their opinion, as the level of sports achievements of a volleyball player grows, the requirements for his intelligence constantly increase. In particular, requirements for the ability to concentrate on logical, consistent and non-standard thinking are increasing. The ability to quickly process information obtained as a result of observations and perceptions is significant. Researchers are convinced that the one who can most effectively and efficiently find effective methods and techniques of wrestling wins in volleyball. The one who is able to realize the tactical plans of his team taking into account the actions of the opposing team becomes stronger. At the same time, all this shall be done in conditions of severe lack of time and in a state of strong emotional arousal. The improvement of tactical thinking occurs mainly due to the improvement of observation, quick wit, initiative and foresight.

An analysis of the studies conducted by (Boichuk et al., 2018; Soyal, Kaya, & Çelik, 2019) showed that the game actions of qualified volleyball players are brought to a high level of automatism. And those actions that seemed to be built according to the type of complex reaction are built according to the simple type. The unexpectedness, lightning speed and accuracy of movements in volleyball make it necessary to develop the reaction speed and movement speed of players. However, according to the authors in volleyball, one should not trust only the reaction speed. When improving it, one shall develop the ability to anticipate possible game moments. As noted on this occasion (Kozina, Chebanu, Repko, Kozin, & Osiptsov, 2018; Kostiukevych, 2019), anticipation is a manifestation of the cognitive activity of the subject of activity. This phenomenon allows, in response to stimuli that act in the present, to predict future events using accumulated experience. In the actions of volleyball players, the main effect of spatio-temporal anticipation is manifested in the accuracy of sensory-perceptual prediction of various characteristics of a flying ball. On this basis, it becomes possible for the player to get the flying ball in a timely manner, to choose a place in the court space and to interact with partners effectively. On the basis of anticipation, a tactical ability is formed in the volleyball players, that helps to coordinate their actions during the game.

Clérico et al. (2019), Ceviker, Ozlu, Deryahanoglu, Demirdoken and Turkay (2020) draw attention to the fact that volleyball players performance on a high level is associated with volitional qualities. The main volitional qualities for the successful competitive activity of volleyball players are determination and perseverance, endurance and self-control, determination and courage, initiative and discipline. Authors consider self-suggestion (self-regulation) to be an important factor that allows an athlete to program consciousness for the manifestation of volitional qualities. Researchers consider the concept "self-suggestion" to be the ability to consciously change the state of their mental sphere and the whole organism in the right direction using appropriate techniques. In their opinion, self-suggestion techniques significantly help the athlete to restore the body's energy capabilities in the process of competitive activity. The systematic overcoming of difficulties in the process of continuous long-term training in compliance with a strict regime results in a significant increase in the level of volitional preparedness of an athlete.

Kozina, Iermakov, Bartík, Yermakova and Michal (2018), Ogar and Lewandowski (2019) show that when choosing a game role for volleyball players, it is extremely important to consider the psychophysiological characteristics of players. However, they are often neglected in volleyball practice. Many problems arise when, during the selection for a particular role, players' personal characteristics are not the main criteria. But, only ability to perform technical and tactical actions, height, dominant left hand and the like are taken into account.

According to experts, it is inexpedient to confine oneself only to information about what technical and tactical actions a player can perform. First of all, it is important to find out his/her personal remarks. Since personal characteristics of volleyball players usually determine the success of their training and competitive activities, (Pavlenkovich et al., 2018) recommend taking into account the type of temperament when choosing a game role for volleyball players. Researchers believe that representatives of sanguine and phlegmatic temperament type are more suitable for a game role – an outside hitter. Choleric in the role of the second wave attacker is the most undesirable variant, although possible. Choleric people often show unstable service return and service itself. Since choleric temperament is characterized by increased excitability and unbalanced behaviour. In turn, phlegmatic as the first wave attacker is the worst variant. Due to the nervous system characteristics and temperament, for phlegmatic it is difficult to cope with the requirements for this game role. He often blocks late and does not have time to start an attacking combination in time. However, for players of choleric temperament this is exactly the role, they can fully perform. Their energy, swiftness, mobility, dedication, emotional recovery are the qualities that will largely determine the success of the actions of the first wave attacker. So, a contradictory situation has been formed between the requirement to study the influence of psychophysiological factors on the effectiveness of the game activity of volleyball players (girls) aged 16 to 18, on the one hand, and the insufficient scientific development of methodological support for solving this pedagogical problem, on the other one. This determines the practical and scientific relevance of the research problem.

*Hypothesis*. It is envisaged that determining the influence of sensorimotor, proprioceptive, perceptual, intellectual functions on the effectiveness of performing techniques in the course of playing by volleyball players (girls) aged 16 to 18 will contribute to a better selection of special exercises in the training process. This approach will improve the players' competitiveness.

*Study purpose* is to determine the influence of indicators of psychophysiological functions and typological features of the nervous system on the effectiveness of competitive activity of volleyball players (girls) aged 16 to18.

**Material and methods.**

*Participants.* The experiment involved volleyball players (girls) who are in the stage of preparation for higher achievements (n = 18, aged - 16-18). The research protocol was approved by the Ethics Committee of the Ivano-Frankivsk National Technical University of Oil and Gas (Ukraine).

*Study organization.* The first study stage included comprehensive testing of players' psychophysiological indicators, diagnosis of typological features of the nervous system. For evaluation we used indicators of sensorimotor, proprioceptive, perceptual, intellectual abilities of athletes. In the second stage, participants' competitive activity study was conducted. We used pedagogical observation to determine the efficiency of volleyball players' (girls') competitive activity. A total of 10 games were analyzed for each of them. In the course of competitive activity analysis we have distinguished the following indicators:

1. Number of ball receptions after their delivery;
3. Number of goals missed;
4. Effectiveness of ball receiving after spikes in the defensive zone
6. Missed spike goals;
7. Successful court protection against fraudulent actions of the opponent;
8. Number of successful spikes;
9. Number of successful ball blocks from of the opponent's spikes;
10. Number of ball deliveries completed.

*Tests aimed at assessing the level of psychophysiological indicators development*

*Test 1:* attention distribution was estimated using a 25 cell table rwith andomly drawn numbers from 1 to 40 (15 numbers were omitted). The study was tasked with finding the numbers that are missing in the table. Time to work with the table is 1.5 minutes (Korobeynikov et al., 2019).

*Test 2*: switching attention speed was estimated using the Schulte table. The study is conducted using special forms, which were 24 red and 25 black numbers. The task was to alternate the search for black numbers in increasing order and red ones in descending order. For example: 1 - black, 24 - red, 2 - black, 23 - red and so on. The main indicator is the time of task completion (Serhiienko, 2013; Korobeynikov et al., 2019).

*Tests 3-4*: quality and speed of operative thinking were evaluated with the help of "Game-3" according to the method of A.V. Rodionov (Serhiienko, 2013; Boichuk et al., 2019).

*Test 5:* speed of information reception and processing was carried out with the help of Anfimov correction test (Korobeynikov et al., 2019). The subject was provided with a correction table and a suggested task – quickly scrolling through horizontal lines of letters, striking out C and K letters within 1 minute. Work with a spreadsheet consisted of determining productivity in 1 minute.

These parameters were used to determine the work accuracy – (A)

$$A = \frac{M}{M + O} \quad \text{(calculation accuracy up to 0.1)}$$

and net performance indicator (E):

E = H x A (calculation accuracy up to 0.1).

For this, the number of scanned characters — H, the number of crossed out letters — M, and the number of errors — A — were counted. Omission of those letters that should be crossed out, as well as incorrect cross out were considered to be mistakes.

*Tests 6-7:* measuring a simple and complex visual-motor reaction. To determine the latent period of a simple and complex visual-motor reaction, Psychodiagnostics computer program was used (Kozina et al., 2011). Testing procedure is described in detail in the work by (Boichuk et al., 2018).

*Test 8:* ability of the subjects to experience kinesthetic sensations was assessed using the test "Ball throws to the goal over one's back" (Serhiienko 2013; Boichuk et al., 2018).

*Test 9:* accuracy of the assessment and measurement of the muscle effort was measured using a wrist medical dynamometer. The subject in a standing position and arms extended to the side showed the maximum effort. In the next three attempts, she received the task to measure the value in (0.5) of the maximum given value, which in inverse proportion characterized the accuracy of the efforts assessment and measurement (Serhiienko 2013).

Typological features of the nervous system of volleyball players (girls) were diagnosed using the observation method (Serhiienko 2013; Boichuk et al., 2019).

*Statistical analysis.* The obtained data were processed using the statistical computer program SPSS 17.0. Multiple correlation analysis was performed.

**Results**

Psychophysiological indicators are important for sports and volleyball in particular. They form the ability of players to tactical actions. Therefore, the study of the relationship between the indicators of sensorimotor reactions, operational thinking, attention properties and the main parameters of the volleyball player's competitive activity is of paramount importance. So, the correlation matrix analysis (Table 1) indicates that the number of effectively performed attacking actions and blocking effectiveness have a close positive relationship with the operational thinking indicators. The percentage of successful ball delivery has a reliable relationship of average level ($r = 0.49$, $p < 0.05$) with the speed of thought processes.

Table 1. Interrelation of psychophysiological indicators and the effectiveness of competitive activity of volleyball players (girls) aged 16 to 18.

| **Psychophysiological indicators** | **Competitive activity performance indicators** | | | | |
|---|---|---|---|---|---|
| | Ball reception | Attack | Defense game | Blocking | Delivery |
| Speed of operational thinking | **-.324** | **-.692** | -.075 | **-.522** | **-.492** |
| Quality of operational thinking | **-.342** | **-.592** | .159 | -.**539** | -.191 |
| Speed of information processing | **-.680** | .284 | .202 | .360 | .288 |
| Attention distribution | **-.677** | -.081 | -.236 | .050 | .002 |
| Attention switching speed | **.**022 | **-.386** | **-.457** | **-.513** | -.228 |
| Differentiation of movement parameters | **.388** | **.621** | .034 | **.575** | **.523** |
| Assessment of muscle effort | **-.585** | **-.660** | -.**369** | **-.402** | **-.512** |
| RCh 1-3, ms | .246 | **-.428** | **.476** | **-.419** | **-.570** |
| RCh 2-3, ms | -.158 | **-.829** | .241 | **-.429** | -.174 |
| SVMR, ms | **.410** | -.248 | **.648** | -.266 | **-.401** |
| Nervous system intensity | **.680** | **.312** | .034 | .267 | .173 |
| Nervous system stability | .217 | **.343** | .267 | **.**082 | **.602** |
| Nervous system lability | **.534** | **.608** | .239 | .189 | .246 |

Note: SVMR – simple visually quick reaction, RCh1-3 – choice reaction of one signal from three, RCh2-3 – choice reaction of two signals from three.

The effectiveness of the functioning of the proprioceptive function in volleyball players (girls) was assessed by the development of their ability to control the spatio-temporal and dynamic parameters of movements. The indicator of the ability to differentiate motion parameters has an average level of correlation with the effectiveness of attacking actions, blocking, and serving the ball. All the parameters of competitive activity studied by us turned out to be interconnected at a low and medium level with the ability of athletes to differentiate muscle effort (from $r = 0.37$ to $r = 0.66$, $p < 0.05$).

Sensory-motor function in our study was characterized by three indicators. This is a simple visual-motor reaction, the reaction of choosing one signal from three and the reaction of choosing two signals from three. These indicators have a reliable interdependence with all the main parameters of the competitive activity of volleyball players (girls). So, the speed of a simple visual-motor reaction has significant correlations (from $r = 0.40$ to $r = 0.65$, $p < 0.05$) with the quality of receiving the ball after serving, protective actions effectiveness and

ball serving effectiveness. Significant interconnections of medium and high levels were found between indicators of a complex reaction of choice (from $r = 0.42$ to $r = 0.89$, $p < 0.05$) and the effectiveness of attacking, blocking, and ball serving. Perceptual-cognitive function was characterized by indicators of the information reception and processing speed, operational thinking speed and quality, attention distribution and switching. The results of the ball reception quality after its serving tightly correlated with the indicator that characterized the information processing speed in volleyball players (girls) ($r = 0.68$, $p < 0.05$). Also, a positive relationship of the average level was found between the effectiveness of this technical and tactical action and the indicator of the attention distribution in athletes. In turn, the indicator of attention switching speed has reliable correlations of low and medium levels with the effectiveness of attacking and defensive actions of players (from $r = 0.39$ to $r = 0.51$, $p < 0.05$).

The type of higher nervous activity of volleyball players (girls) was characterized by three basic properties of the nervous system. These are intensity, stability and lability of excitation and inhibition processes. The nervous system intensity has a reliable relationship between the average level ($r = 0.68$, $p < 0.05$) and the effectiveness of ball reception after serving. A lower level correlation relationship was found between this feature of the nervous system and the effectiveness of attacking actions of volleyball players (girls). A significant level of correlation was found between the stability of nervous processes of players and the effectiveness of ball serving ($r = 0.60$, $p < 0.05$). The effectiveness of attack and ball reception after serving has an average level of relationship with the nervous processes mobility.

**Discussion**

Both in sports practice, and in most scientific and methodological works, much attention is paid to the physical qualities development in athletes, to the body's reaction to various training programs, development of fatigue and recovery processess, etc. (Kapkan, Khudolii, & Bartík, 2019; Koryahin et al., 2019; Kostiukevych, 2019). However, clearly not enough attention is paid to the regulatory effect of the athlete's psyche on the mental state, psychomotor, emotional manifestations. Undoubtedly, these and other psychophysiological factors significantly affect the quality of the training process and competitive activity of players (Clérico et al., 2019; Nagovitsyn et al., 2020).

To determine the quantitative features of operational thinking, researchers usually use various kinds of motor tasks. For this purpose, the so-called “game-3” was used in our study. When solving the problem, the number of moves spent was also determined. During the experiment, it was assumed that the effectiveness of the competitive activity of volleyball players (girls) is mainly to determine the indicator “problem solving speed.” The indicator “quality of problem solving” (number of moves spent) was provided with secondary importance. However, the study results showed almost equal significance of both parameters. In our opinion, this is due to the fact that recently the coordination complexity of performing all the technical methods of playing volleyball has increased. For example, we take a reliable relationship between the effectiveness of attacking actions of volleyball players (girls) and the quality of thought processes. It can be explained by a significant increase in serve in modern volleyball. In accordance with this, the quality of ball reception after serving is deteriorating. As a result, the number of spikes against which the opponent manages to build a well-organized group block increases. This requires solving tactical tasks not only quickly, but also with original solutions.

In the same way, one can explain the reliable positive relationship between the indicator of rplayers’ thinking rationality and the blocking effectiveness. As noted by (Stankovic, Peric, Ruíz-Llamas, & Quiroga-Escudero, 2017), players who perform blocking almost always face a difficult choice. They shall determine to whom of the attacking players of the opposing team the transfer will be addressed. Moreover, during the cgame ourse, situations often arise when four attacking opposing team opponents can appear against three blocking front-line players. Therefore, it is obvious that the key points of effective blocking are anticipation, decision making, speed of movement and hopping ability. The data obtained are quite consistent with the studies of scientists who studied the issues of psychological training in volleyball (Trajkovic et al., 2017; Kokun, Korobeynikov, Mytskan, Cynarski, & Korobeinikova, 2019). In particular, these experts point to the requirement for young volleyball players (girls) to develop the ability to think creatively when solving tactical tasks.

Kinesthetic sensitivity indicator in players has reliable relationships with the effectiveness of attacking and defensive actions. The ability to assess muscle effort is interconnected with all the competitive activity parameters in volleyball players (girls). The study results confirmed the opinion of (Zhelezniak et al., 2001) about the high importance of the ability to control the spatio-temporal and dynamic parameters of movements for the successful game activity of volleyball players (girls). Indeed, on the basis of high level development of these abilities, specialized perceptions are formed. This is the “sense” of ball, partner, playground, net, etc. They, in turn, allow one to better understand rational options for performing technical and tactical actions. Researchers recommend the systematic use of special exercises for the targeted improvement of these functions.

Studies conducted have also shown that improving the quality of volleyball players’(girls’) attention is an important reserve for improving technical and tactical skills. The significant positive relationship between attention distribution and ball reception performance after submission is explained by the requirement to determine the ball delivery manner, direction, speed, and trajectory almost simultaneously. In this case, the basic

vision of the volleyball player should be directed to the ball, and peripheral vision helps to determine the point where the ball shall be directed. The reliable relationship between low and medium levels of attention switching speed and effectiveness of the attacking and defensive actions of volleyball players (girls) can be explained by the instantaneous change of playing situations in modern volleyball. The high speed of ball flight requires rapid movement of players and simultaneous tracking of the ball and movement of partners and players of the opposing team. Our findings are comparable to those of other authors (Pavlenkovich et al., 2018; Surina-Marysheva et al., 2019). Researchers in particular note that attention is one of the decisive psychological factors for achieving high athletic performance in volleyball. As the focus improves memory, perception, imagination, and thinking processes. These authors recommend to often use a variety of exercises with multiple balls and all kinds of movements. Exercises are also required where a quick switch from one object to another or from one action to another is required.

Speaking of the speed of sensorimotor reactions, they have a reliable relationship with all the game techniques that have been studied. We believe that it is natural. After all, the speed of movement reactions, coupled with the action speed and movement speed are one of the main factors that determine the success of volleyball players' (girls') tactical game actions. Accordingly (Zhelezniak et al., 2001; Fathi et al., 2019) indicate a steady increase in the speed of modern volleyball. That is, the delivery speed increases, the spped of transfer for the spike. Another proof of the increase in modern volleyball speed is the increasing number of back line attacks. At the same time, if the attack game speed increases, then the requirements for speed of blocking players' reaction increases accordingly. As a result, to develop the speed of movement of volleyball players (girls), these researchers recommend using a large number of exercises that require rapid switching from one activity to another. Particularly valuable, in their view, are games and a variety of closed-net tasks.

Currently, a number of studies have proved that typological characteristics of the athletes' nervous system play a significant role in achieving high athletic performance. When analyzing the primary results of pedagogical observation, it should be noted that the nervous system intensity, stability and lability of the nervous processes in the studied volleyball players (girls) are sufficiently expressed. In our opinion, this is logical, because the players went through the preliminary, intermediate and main stages of selection for volleyball. A competitive activity in this sport makes high demands on the aforementioned personal characteristics of players. The reliable relationships we found between the nervous system intensity indicator – excitation and the effectiveness of the protective and attacking actions of volleyball players (girls) confirmed the previous conclusions made by other researchers (Korobeynikov et al., 2019; Rogowska, 2020). Stable nervous system allows to steadily act in the attack completion, taking innings, stably and efficiently perform innings, protective actions. However, according to the authors, this does not mean at all that players with a weak nervous system shall not be involved in volleyball. Since under the condition of a high level of development of volitional qualities and skillful psychological regulation, the deficiencies in the characteristics of the nervous system can be sufficiently offset by various compensatory mechanisms. Our correlation analysis revealed a reliable relationship between the balance of nervous processes of volleyball players (girls) and the successful ball delivery. This confirms the opinion of (Kokun et al., 2019; Nagovitsyn et al., 2020) that the nervous system stability provides accurate game calculation and plan implementation stability. Nervous processes lability provides excellent adaptability of volleyball players (girls) to the game conditions, which are changing rapidly. In contrast to mobility, the nervous system inertia prevents the athlete from quickly switching attention from some motor situations to others. However, inertia is one of the factors that influence the information storage (Popkov, 2017; Boichuk et al., 2019). Nervous system inertia can be compensated by a well-developed stability of the player's attention, observation, ability to predict the development of the game situation.

Thus, the data we obtained allowed us to study the features of the relationship between indicators of psychophysiological functions, typological characteristics of the nervous system and the effectiveness of competitive activity of volleyball players (girls) at the stage of preparation for the highest achievements. A significant number of reliable relationships showed a direct relationship between the effectiveness of the game activity of volleyball players (girls) and the high level of development of sensorimotor, proprioreceptive, perceptual-intellectual functions. The great importance of intensity, lability and stability of nervous processes in the structure of the integral preparedness of volleyball players (girls) aged 16 to 18 is confirmed in comparison with other personal characteristics of players. Along with this, further research is required to develop training tools to improve the psychophysiological functions of volleyball players (girls) at different stages of many years of sports development, taking into account the specialization and coordination complexity of training loads. Undoubtedly, such special exercises will significantly influence the improvement of technical and tactical skills of volleyball players (girls). It seems that it is time to pay more attention to the application of an individual approach in the training process of volleyball players (girls), taking into account the type of their nervous system and the characteristics of the cognitive processes course.

**Conclusions**

1. Correlation analysis results suggest that psychophysiological factors significantly influence the effectiveness of the technical and tactical actions of volleyball players (girls) aged 16 to 18 in a competitive

environment. Out of 65 calculated correlations between indicators of players' psychophysiological functions and the effectiveness of their technical and tactical actions, 54% of reliable relationships were found out of all the considered ones.

2. Game activity at the stage of preparation for the highest achievements makes strict demands on the speed and quality of thought processes of volleyball players (girls), intensity and stability of their attention, speed of motor reactions. This activity requires exceptional accuracy in the "sense" of ball, partner, playground, net, etc. These specialized perceptions largely determine the technical and tactical skills of the player.

3. Personality and typological features of volleyball players (girls) determine the nature of their behaviour in the process of competitive activity, reflected in the particulars of their assessment of game situation and the nature of decision-making. Taking into account the type of temperament will allow the trainer to take an individual approach to each athlete and make timely adjustments to the training process to achieve high sports results.

**Conflict of interests**

The authors declare that there is no conflict of interests.

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