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## **FEATURES OF PSYCHOPHYSIOLOGICAL CHARACTERISTICS OF QUALIFIED BADMINTON PLAYERS**

According to the official rules of badminton, it is a sports game that is held on a small playground divided by a net into 2 equal parts. On them there are opponents who by means of a racket try to throw a shuttlecock (a plastic hemisphere with a feather or nylon frame) over a net on other half of a court so that the opponent could not repel it back.

At the initial level, athletes have access to the simplest elements of the game, which do not require a rich technical arsenal. At a higher level, badminton is much more dynamic and requires players to have a high level of athletic training. A modern badminton athlete must be very well prepared physically, have a good command of various techniques, have a wide arsenal of tactical decisions, and must demonstrate a high level of stress resistance.

Badminton is considered one of the three most difficult physical sports games, is the fastest among the so-called "racket sports". During one game, the athlete runs about 1.5 km and comes into contact with the shuttlecock up to 400 times. The impact density is 0.7 contacts per second. The longest match in badminton lasted up to 1.5 hours, with the shuttlecock kept in play for 45 minutes. According to various experts, the athlete's heart rate during the meeting can range from 200-220 beats per minute.

According to its characteristics, badminton belongs to acyclic complex coordination sports, it is characterized by the following features:

- speed of movements;
- speed of thinking;
- speed of performance of technical receptions.

The most important physical qualities include speed in all its manifestations, flexibility, agility and endurance.

Badminton has undergone significant changes in technical equipment, cost-effectiveness of technical and tactical training in recent decades. Reducing the weight of the racket, improving the quality of the shuttlecock and racket, changing the rules of sports led to a significant increase in the speed of the game, reducing the processing time of the shuttlecock, and as a result - increase in the intensity of training and competitive load. These changes affected the structure of physical training, competition strategy, planning and programming of the training process, which led to a change in philosophy and conceptual foundations of badminton.

Experts point out that the assessment of athletes on psychophysiological qualities is more predictable than determining the level of development of physical qualities, because psychophysiological qualities are genetically more conservative and less dynamic in ontogenesis than physical qualities.

Analysis of the literature has shown that the main psychophysiological characteristics that affect the success of play activities include the main neurodynamic characteristics of the higher nervous system. They are innate, unchanging, little change in ontogenesis and play an important role in determining the signs of human behavior and psyche. A set of cognitive characteristics is important for the successful solution of tactical tasks while playing badminton. It is the speed and quality of mental processes can be the decisive factor that will affect the end result. An important aspect of the psychophysiological state of the athlete is resistance to stressful situations, which are saturated with competitive activities of a badminton player.

Manifestations of higher nervous processes are present in almost all components of sports activities and provide a quick reaction, rapid perception and processing of information, speed of mastering technical elements and rapid switching from one activity to another.

Experts point out that the success of professional activity in extreme conditions is influenced by such features of the nervous system as strength, mobility and balance of the nervous system.

The strength of nervous processes determines the endurance of the athlete's nervous system under the influence of strong or prolonged stimuli.

Balance of nervous processes provides adequate reactions under the influence of stressors and stability of competitive activity. The balance of the nervous system is considered as a feature that determines the overall energy level of the body in general and the brain in particular. Provides the ability of the CNS to clearly form anticipatory reactions on the site, high development of spatio-temporal anticipation (prediction), determining the position of a dynamic object in space and time based on directly available visual information, which increases the effectiveness of gaming. The predominance of excitation or inhibition processes significantly affects the individual style of activity and human behavior.

Mobility of nervous processes – a condition for the development of the ability to quickly change the structure of action when changing the pace and rhythm of work, tactical repertoire in the competition against the opponent. Functional mobility of nervous processes - the maximum possible speed of information processing of varying complexity in a shortage of time. Characterizes the speed capabilities of the nervous system: signal perception, analysis, decision making, command, etc. Depends on the speed capabilities of the central cortical structures and features of the peripheral nervous system.

Studies of research conducted over many years have shown that the functional mobility of nervous processes in highly skilled athletes is of great importance for playing sports. Sports activities require the athlete to be able to quickly change the strength and direction of movement, to adequately assess the game environment, to make instant decisions in changing conditions. The basis of the formation of a variable motor stereotype is the functional mobility of nervous processes. In the dissertation of Serova L. it is noted that the bandwidth of information channels can act as a diagnostic and prognostic criterion in the control and selection of promising athletes, because it shows a correlation with the growth of skills from beginner to highly skilled player.

The corresponding properties of the nervous system provide a manifestation of the leading physical qualities of highly qualified badminton players:

The activity of the CNS, which provides the mode of muscle function, the coordination of functions of all organs and systems is responsible for all manifestations of endurance;

The high level of mobility of nervous processes provides a manifestation of coordination skills, which allows the badminton player to navigate in rapidly changing game situations, instantly switch from one type of action to another. Coordination of movements allows to perform motor actions, connects them in time, space and effort (speed, accuracy and timeliness of technique depend on the coordination of movements).

The ability of the CNS to quickly receive, analyze and manage several activities is provided by the total activity of analyzers and the mobility of nervous processes and affects the ability to concentrate, distribute and switch attention.

Badminton is characterized by a complex manifestation of speed during the game. The speed and accuracy of actions when performing the technique in a strict time limit depends on the balance and mobility of nervous processes.

In the initial stages of selection, modeling and control of psychophysiological characteristics will help the practical detection of a set of game abilities inherent in individual, fast play - a high level of simple reaction and RDO, coordination skills, differentiation of muscular effort (accuracy), diligence and efficiency.

Properties of psychomotor skills, as an integral part of neurodynamic characteristics - are relatively stable, individual features of movement, manifested in accuracy, frequency, strength and coordination.

Almost all badminton player's game activity is dependent on visual perception, which is why it will be important to study a simple visual-motor reaction. The speed of simple visual-motor reaction (SVMR) is one of the most important qualities on which the success of competitive

activity depends. It is believed that the speed of a simple visual-motor reaction determines the functional state of the human central nervous system as a specialized control organ. The magnitude of the latent period of the reaction characterizes the rate of passage of excitation from the receptors to the executive organ.

The success of gaming is influenced not only by the functionality that controls a given pace of play, but also a set of cognitive characteristics that shape the tactical skills of badminton players.

Like any game activity, the game of badminton takes place in the form of solving tactical tasks related to the perception of moving objects (shuttlecock, opponent), assessing the parameters of movement, predicting the development of the game situation and making operational decisions. During training, specialized psychomotor functions are achieved at a particularly high level, which determine the effectiveness of preventive reactions to a moving object, as well as the speed of perception and processing of information.

Evaluation of psychophysiological characteristics in sports games is quite a difficult task. This is due on the one hand, to the impossibility of objective measurement of results. On the other hand, psychophysiological characteristics depend on a whole set of factors of very different nature and different degrees of compensation and interdependence.

The success of motor activity is ensured by a high level of processes of perception, analysis, comparison and generalization, based on visual-motor coordination, fine differentiation of musculoskeletal sensations, spatial and temporal perception of different movements.

Cognitive abilities are considered as individual stable features that determine the uniqueness of the strategy of perception and processing of information, problem solving, learning and other types of cognitive activity.

At the first stage of solving a tactical task in sports games the most important are psychophysiological characteristics that provide perception and analysis of the game situation: visual perception, attention and basic characteristics of attention - volume, intensity and stability of attention, as well as switching and distribution of attention. At the initial stage of perception and primary analysis of external information is carried out at the level of sensory receptors (visual, auditory, tactile). In the future, the process of perception deepens, attention is activated and memory is involved. This helps to obtain information in the memory area of the brain and its memorization. The received information is compared with the existing set of answer options, which are in the departments of short-term and long-term memory. Comparison of the received information with available sets of variants of decisions in memory occurs at the level of cortical departments of a brain (thinking process) and is an integral part of learning mechanisms.

Perception – a biological mental function that determines the complex process of receiving and transforming information, which occurs through the senses, which form a subjective holistic image of the object.

Attention – the selective focus of perception on a particular object. Concentration of mental efforts at a given moment of time on some object (phenomenon) of objective or subjective reality (on sensory or imaginary events). Attention is a dynamic characteristic of any mental activity. Unlike other processes, attention has no meaning of its own, it is manifested within perception, thinking, imagination, speech and other mental processes.

Memory is a type of mental activity that stores, accumulates and reproduces information. G. Korobeynikov believes that memory is the basis of thinking as a higher mental process of human cognitive activity. There are operative memory, which contains a small amount of information that is stored for a short period of time. Short-term memory stores a limited amount of information that is stored for a longer period. This is the process that regulates the exchange of information with long-term memory. Long-term memory stores a significant amount of information for a long time or permanently.

In the second stage of solving a tactical problem, the mental functions that are responsible for analyzing the game situation, processing the information that is constantly coming in and finding the best solution are important.

Operational thinking – is characterized by the effectiveness of solving tactical tasks and quantitative characteristics that determine the quality of the decision (decision time, number of errors, work intensity, etc.).

Operational thinking has a number of specific features:

- the close connection between the perception and understanding of rapidly changing information. Decision-making often merges with the process of its implementation;
- responsibility for the decision. That is, an important feature of operational thinking is the presence of extreme conditions;
- the presence of a strict time frame.

The quality and accuracy of solving the second stage of the tactical task is influenced by the level of general mental abilities. Mental (intellectual) abilities are a combination of all human cognitive abilities: sensation, perception, memory, imagination and thinking. The human intellectual system depends on the amount of working memory, memory, ability to predict, logic, multilevel hierarchy of systematic selection of information, consciousness.

Different content of activity requires the development of certain intellectual abilities of the individual. The development of certain qualities of general cognitive abilities is determined by both the genotype of the individual and the breadth of his life experience.

The third stage of solving the tactical problem depends on the psychophysiological characteristics that provide motor implementation. Effective solution of motor problems is associated with a latent period of reaction and a complex manifestation of psychophysiological characteristics (psychomotor, neurodynamic and cognitive characteristics).

As a result of the analysis of the literature available to us it is possible to draw the following conclusions:

1. It is established that badminton is considered to be one of the three most difficult physical sports in terms of physical activity, is the fastest among the so-called "racket sports", which requires the athlete perfect physical training, mastery of various techniques, a wide arsenal of tactical solutions stress resistance.

2. It is shown that changes in the rules and technical equipment have led to significant changes in the structure of physical training, competition strategy, planning and programming of the training process, which led to a change in philosophy and conceptual foundations of badminton.

3. It is determined that the purpose of control is to optimize the process of training and competitive activities of athletes based on an objective assessment of various aspects of their training and functionality of the most important systems of the body. This goal is realized by solving various private problems related to the assessment of athletes, the level of their training, the implementation of training plans, the effectiveness of competitive activities, etc.

4. It is proved that the greatest pedagogical effect in long-term planning and control of the training process can be expected only in the case of taking into account the favorable age periods of the natural maximum of the development of a particular physical quality.

5. Experts point out that the assessment of athletes on psychophysiological qualities is more predictable than determining the level of development of physical qualities, because psychophysiological qualities are genetically more conservative and less dynamic in ontogenesis than physical qualities. The study of psychophysiological characteristics provides additional information about the functional state of the athlete during training and competitive activities. It is known that sports results largely depend on the individual typological characteristics of the person, as well as on the extent to which these features are used to realize the full range of capabilities of the athlete.

6. Currently, the issue of assessing the effectiveness of competitive activities in game sports is of great importance. From a simple protocol record, coaches-analysts move to the use of computer programs that allow you to quickly assess the effectiveness of competitive activities, both each player and the team as a whole.