MODEL CHARACTERISTICS OF THE PSYCHOPHYSIOLOGICAL STATE OF HIGHLY-QUALIFIED ATHLETES IN A STRESSFUL SITUATION

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Abstract

The effectiveness of the competitive activity of top-class athletes depends on the level of all kinds of trainings, but the skill of regulation of their psychophysiological state is of high priority for a player in a stressful situation of competition. The result of the overall performance often depends immediately on the psychophysiological state of an athlete in the moment of realization of the "last" technical action of a game, be it a foul shot in a basketball game with a tie during the last seconds of a match or the last ball in a frame at a cost of the victory or the loss of a billiard match. Due to the reason the nervous system, with the individual and typological peculiarities of the athlete, is in charge of the high precision of movements and proprioceptive sensuality in differentiation of muscular efforts, anxiety level, strength and mobility of nervous processes.

The objective – the establishment of the model characteristics of the psychophysiological state of highly-qualified basketball and billiard players in the moment of realization of a technical action under conditions of a stressful situation.

Methods. theoretical analysis and generalization; method of expert estimations; psychophysiological methods; pedagogical observation; pedagogical testing; methods of mathematical statistics.

Results. In the course of the research the ideal characteristics of the psychophysiological state of highly-qualified basketball and billiard players for the effective realization of a technical action under conditions of the stress have been determined.

Conclusions. Modelling of a stressful game situation and the use of a number of psychophysiological and pedagogical tests have allowed to obtain the average figures of quality of the equilibrium function with and without visual control, voluntary attention span, attention effectiveness, productivity, stress tolerance and coefficient of motivational, volitional and typological component in high-qualified athletes.

Key words: quality of equilibrium function, voluntary attention span, attention effectiveness, coefficient of the motivational element, stress, model characteristics.

Introduction

The modern level of the competition at championships involves the preference for athletes with the high level of readiness of psychophysiological component, due to the fact that a high precision of movements and proprioceptive sensuality in differentiation of blow power, pass or shot is required in sport games [4, 12, 13].

The level of the modern experimental psychology allows not only qualitatively but also quantitatively estimate some intellectual functions. If the improvement of the tactical variability in games-based sports is possible due to the increase in the productivity of mental activity of athletes, then the optimization of the state of "finish" in sport games is possible to achieve with the help of the correction of the psychophysiological state in the stressful situation of competitions [11, 16].

The majority of the concepts of sport trainings improvement consist of the development and use of methods of psychophysical abilities diagnosing based on the model characteristics of the best athletes [14-16]. The analysis of scientific and methodical literature and generalization of the advanced training experience demonstrates the lack of attention of specialists to the integral assessment of

the psychophysiological state of high-qualified athletes in game-based sports (basketball and billiard sports) in the moment of realization of a technical action under stressful conditions [1-9, 15].

The objective – to determine the model characteristics of the psychophysiological state of high-qualified basketball and billiard players in the moment of realization of a technical action in a stressful situation.

Methods

Methods of the research: theoretical analysis and generalization; method of expert estimations; psychophysiological methods; pedagogical observation; pedagogical testing; methods of mathematical statistics.

Particiants. Fifteen basketball players and fifteen billiard players with sport qualification of CMSU, MSU and MSUIL have taken part in the research.

Organization of the research has been conducted in two stages. During the first stage a list of parameters of the model characteristics of the psychophysiological state of high-qualified basketball and billiard players in the moment of realization of a technical action under stress has been determined. During the second stage the development of the model characteristics of the psychophysiological state of high-qualified basketball and billiard players in the moment of realization of a technical action under stress has been conducted.

Results and discussion

Method of expert estimations concerning characteristics of the psychophysiological state of high-qualified basketball and billiard players (n=30) in the moment of realization of a technical action under the conditions of competitions has allowed to determine dominant qualities of the psychological readiness for the victory: motivation, anxiety level and attention span [7, 8]. The concordance coefficient, which equals to W=0,76, proves the homogeneity of a group of experts. The athletes have been asked to model the following competitive situation: a basketball player has to do a foul shot in the final match with a tie for both teams during the last seconds of a game; a billiard player has to play "match ball" with a frame tie with the opponent.

Having analyzed the answers of the experts to the questions in a questionnaire, it is possible to separate the main components of the psychophysiological state of high-qualified basketball and billiard players in the moment of realization of a precise technical action under pressure: attention concentration; mental processes; nervous processes (strength and mobility); differentiation of muscular efforts, movement coordination.

The majority of the athletes have felt discomfort at least once in the moment of getting ready for a "match ball" performance – 83,3 %. 73,3 % athletes have felt objective changes of their psychophysiological state in the moment of realization of a precise technical action under pressure, among which 26,7 % describe their state as «Feel anxiety, rise of the heart rate, the appearance of negative thoughts», 16,7 % – «Feel aggression, thoughts are only about the victory», 13,3 % – «Feel the fear of defeat, hands shivering and neck muscle tension», the group with the highest percentage (33,3 %) has given the answer – «Feel confidence, the attention concentration is only at the performance of a technical action». It is interesting that the respondents of the last group have the MSUIL qualification and have added to the means of correction of the psychophysiological state in the moment of realization of a precise technical action under the stressful conditions of competitions: «modelling of a positive result and breathing control» and the use of methods of the autogenic training. The athletes of the CMSU qualification have more negative manifestations close to: «I think about how not to make a mistake» as dominating.

It is possible that the reason why the results of a modified test of the quality of equilibrium function without visual control with modelling of a "match ball" situation have appeared to be definitely lower in athletes with the CMSU qualification.

The psychological component has also been defined on the basis of the analysis of the motivation of athletes to win. The multivariate analysis of the most significant contribution to the guaranteeing of the successful competitive activity of billiard players has been conducted, during which the advantage of motivational, volitional and typological component of readiness – 71 % – has been discovered. The analysis of the results of the questionnaire points to the high motivation level of athletes to win.

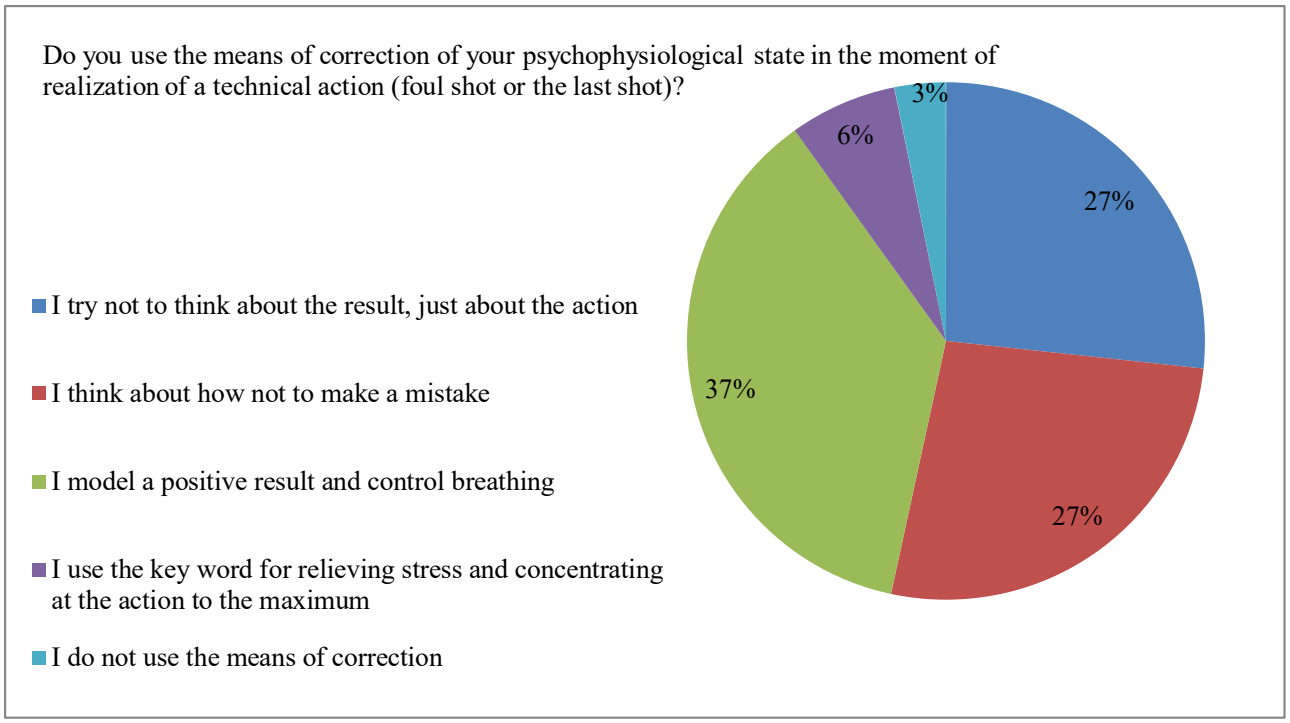

Fig. 1. Means of Regulation of the Psychophysiological State in the Stressful Situation of "Match Ball"

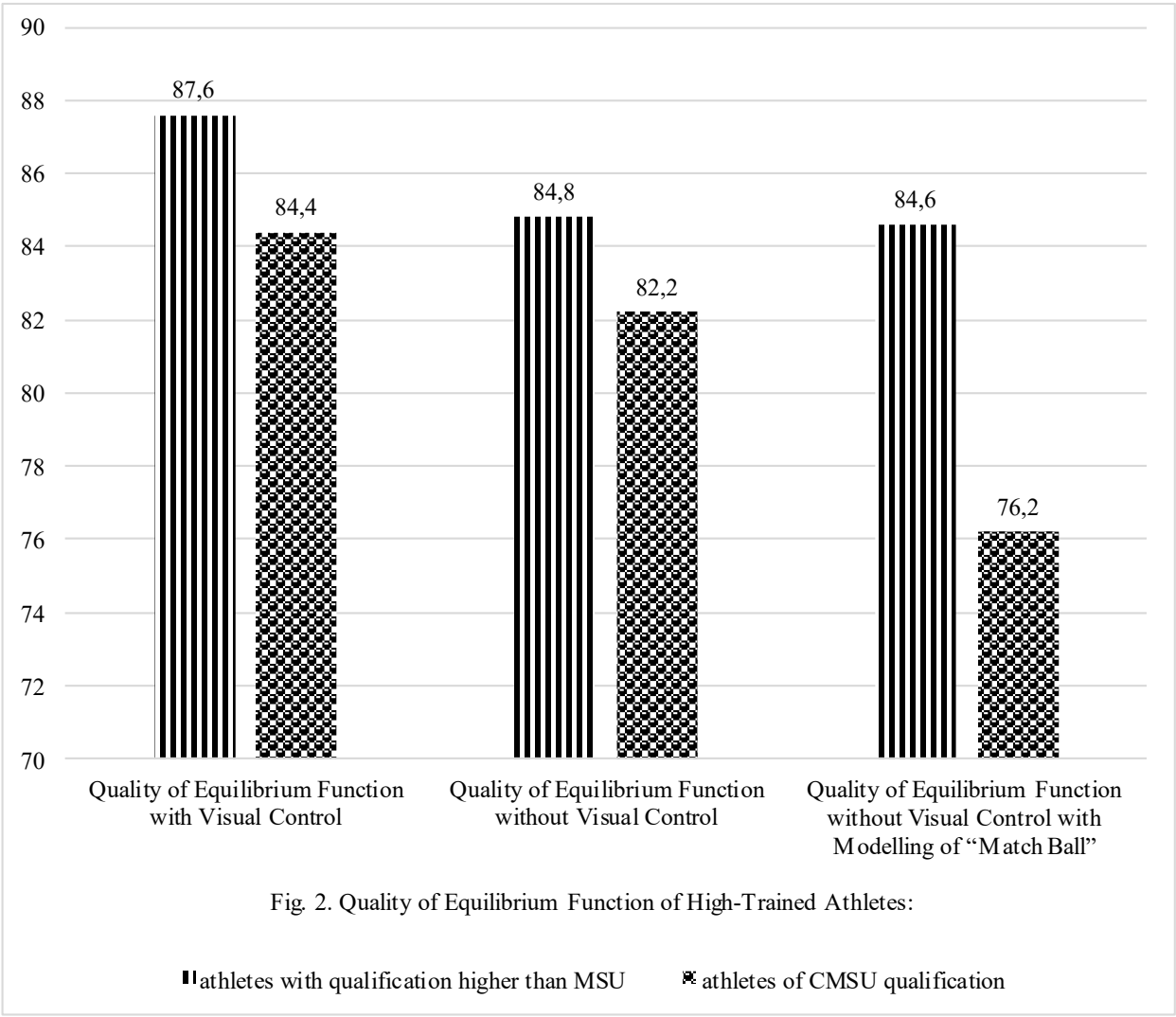

Fig. 2. Quality of Equilibrium Function of High-Trained Athletes:

The productivity of the mental activity of athletes is determined by the speed and quality of information processing. The study of mental working capacity of athletes in the test has allowed to discover the following peculiarities: the athletes of the MSUIL qualification solve a bigger number of problems in less amount of time. Furthermore, the athletes of the mentioned group in particular demonstrate the highest level of stress tolerance and attention concentration in extreme conditions of competitive opposition.

Summing up the above-stated, the experimental group, which has included the athletes who have demonstrated high figures of the quality of equilibrium function without visual control with modelling of a stressful situation, has been defined for establishing "ideal" psychophysiological state.

The average figures of the quality of the equilibrium function with and without visual control, voluntary attention span, attention effectiveness, productivity, stress tolerance and coefficient of motivational, volitional and typological component have been used for establishing the model characteristics of the psychophysiological state of high-qualified basketball and billiard players in the moment of realization of a technical action under pressure.

Juxtaposition of individual characteristics of a competitive performance with the model data allows to establish the most general reserves of the increase of an athlete's preparation level, to evaluate the prospects of the further improvement. It is worth noticing that, while evaluating the competitive activity, the reliability of athlete's performance acquires a significant importance, which indicates not only the level of the psychical readiness, but is an integrated index of the estimation of physical, functional, psychical, mobilization qualities of an athlete.

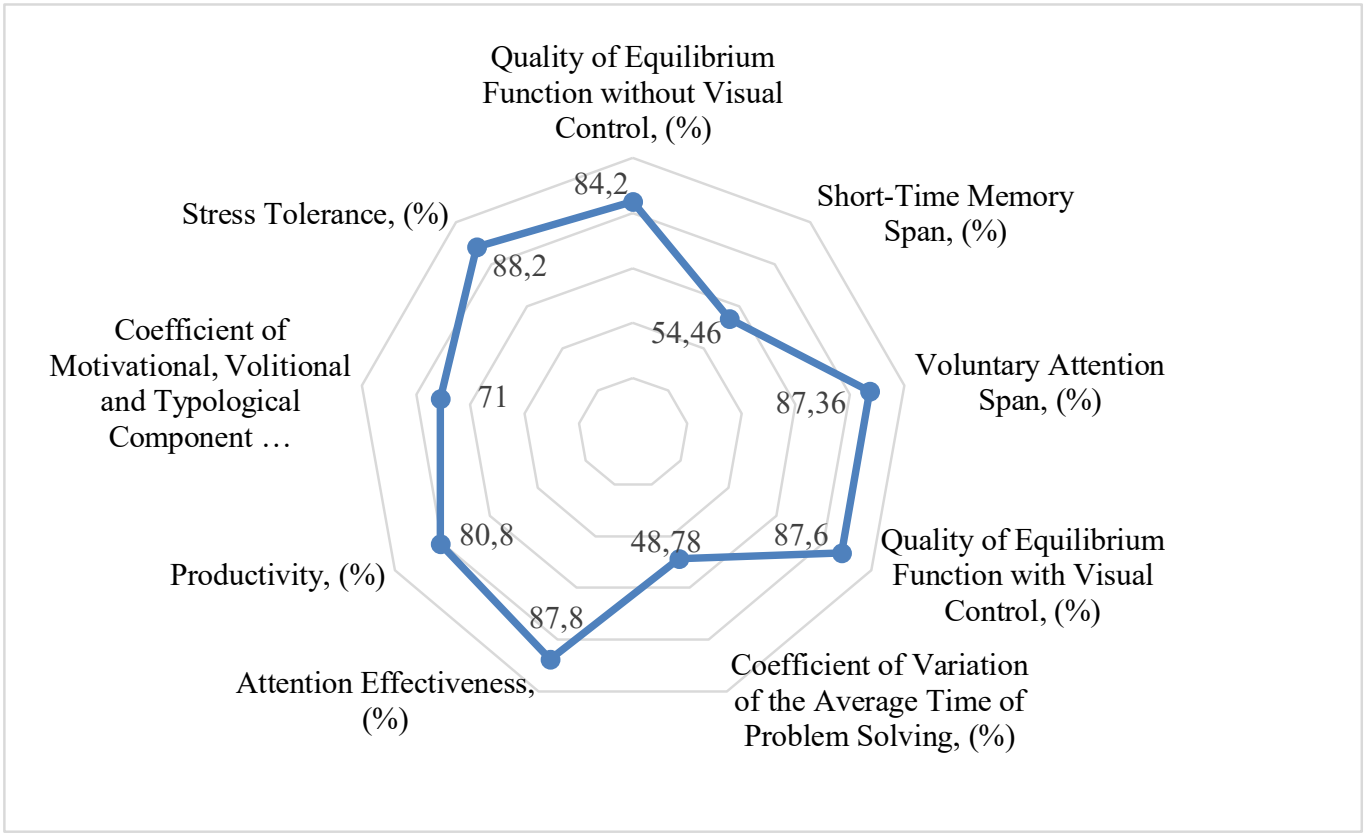

Fig. 3. Model Characteristics of the Psychophysiological State of High-Qualified athletes in Game-Based Sports in the Moment of Realization of a Technical Action Under Stressful Conditions

Conclusions

Modelling of a stressful game situation and the use of a number of psychophysiological and pedagogical tests have allowed to obtain the average figures of quality of the equilibrium function with and without visual control, voluntary attention span, attention effectiveness, productivity, stress tolerance and coefficient of motivational, volitional and typological component in high-qualified athlete. The provided figures of a group of athletes with the high coefficient of the competitive performance reliability have become the basis of the model characteristics of the psychophysiological state of high-qualified basketball and billiard players in the moment of realization of a technical action under pressure.

Conflict of interest

The author claims that there is no conflict of interest.

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