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Physical Education Of Highly Qualified Chess Players.

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ABSTRACT

This paper deals with the main principles of physical education of highly qualified chess players during preparatory and competitive phases of a mesocycle, there are arguments given that physical activity is needed to influence functional state of the body during competitions, and that there is a need to determine regular patterns of restorative processes after play. Innovative method of physical education, evaluated and implemented in training system of sportspeople chess players, provides achieving high results, improving functional state of a chess player's body during preparatory and contest periods, developing endurance and coordination, beneficial to performance in chess.

Keywords: physical education of chess players, physical condition, training system in chess, athletic training.

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INTRODUCTION

It becomes clear that the development of dysfunctions and various pathologies in the human body is very often associated with the nature of his professional activity [1-4]. In this case, the appearance of pathology can make a strong imprint on the activity of the organism in the biological [5,6] and the psychological plan [7,8]. Very often occurring changes are negative [9,10], hindering further life activity [11,12] and worsening the prognosis [13,14]. In this connection, the task is to develop treatment options that can simultaneously softly correct dysfunctions and pathologies that arise in the body in any situation [15,16] and simultaneously restore the reserves of human activity [17,18]. Pharmacology has made great strides in this regard [19, 20]. With her help, managed to take control of cardiac pathology [21,22]. This type of pathology is very common and therefore weakens the functional capacity of a significant part of the population [23]. At the same time, other variants of influence on the human body are necessary, which can increase its viability and functional readiness for various activities [24]. An alternative to medicamentous effects are non-drug effects, which have shown their worth in many studies [25,26]. One of the important points of application of health effects in the course of human activity is sport [27,28]. With the success of preserving and restoring health, the athlete is closely linked to his future sporting outcome [29,30,31] and his overall sporting longevity [32,33].

The process of playing chess is characterized by heightened attention concentration and intensive thinking, and is accompanied by highly strained brain work. The brain, being 2-3% from total body weight, consumes 20% of oxygen needed by the body. Intensification of brain work speeds up metabolism and energy expenditure, and temporary unification of functional systems of the body causes quick exhaustion of sensory organs and nerve centers while physical activity is limited [34]. Hours-long chess players' training lowers body muscle tone, slows efferent impulsation in the CNS, speeds up the development of inhibitory processes in cerebral cortex, and slows metabolic processes in tissues. Competitions of highly qualified sportspeople chess players usually last from 8 to 12 days, with 3-5 hours per game per day. Body reaction is further altered if there is emotional stress present during brain work: agitation, impatience, anger, etc. [35].

During chess play the fatigue and restorative processes take place dynamically, and fatigue causes a specific action, when on the outside the brain work is stopped, and the body compensates working expenses during a certain period of time. Restorative processes may take place during the game by activating oxidative reactions of resynthesis of energetic substances, and their intensity increases after the game. The main means of eliminating the muscle activity deficit is physical exercise, for it supports the basis of high working capability and body resistance to endogenous and exogenous environment factors [36].

With increase in sports mastery and achievements, psychological and physical training take a considerable amount of chess players' training load, for tactical and technical, and information-communicational components of educational technologies are mastered roughly in similar way across the world [37]. The concept of training system of M. M. Botvinnik (the 6th World Chess Champion) was based upon a professional approach to achieving success "in equal conditions" by studying chess theory, knowledge of himself and his personality, strengthening his nervous system, increasing psychological stability and physical fitness level. A. Y. Karpov, the 12th World Chess Champion, speaking about his system for preparation to world championship matches, specifically emphasized the importance of physical fitness. Highly qualified chess players during their preparatory phase are actively using means and methods of physical culture and sports to enhance the functional state of the body, to maintain working fitness and physical well-being during competitions. There is a lack of systemic approach in solving the problem of physical training of highly qualified chess players, the forms, kinds, amount, duration, and manner of exercise load are undetermined. Chess masters and grandmasters usually choose some kind of sport or physical activity themselves, but everyone agrees that physical exercise is vital at the phase of the higher sports mastery, being able to enhance the functional state of the body during lengthy competitions [38,39].

According to the Supplement 9 to the Federal Standard of Sports Training in Chess, the norms for the maximum amount of sports training in chess at the phase of the higher sports mastery make for 32 hours per week, assuming 14 training sessions with 2-3 sessions per day, each being longer than 2 hours. According to the Federal Standard, the set requirements to general physical preparedness are aimed to achieve a certain development level of physical qualities, which would provide an optimal state of the sportsperson-chess player's body during training and competitive periods.

The research objective is to analyze and reveal the trends in the process of chess players' physical training at the higher sports mastery phase in a mesocycle.

METHODS AND ORGANIZATION OF THE RESEARCH

In 2014-2016, a cross-functional scientific team of the department of physical culture and recreational technologies of Russian State Social University evaluated and implemented an innovative method of physical training of highly qualified chess players in a mesocycle. Control measurements of physical and functional parameters were conducted from January 2015 to June 2015 once per month during preparatory and competitive periods. The subjects were students and aspirants of RSSU joint team in chess, qualified no lower than FIDE Masters, 14 people in total. Checkpoints (experimental cross-sections) were set 1 per month during 6-month mesocycle, at preparatory and competitive stages. In order to form a positive motivational and value orientation to the process of physical training, the sportspeople chess players were asked to choose forms, kinds and a set of means of physical activity. Endurance levels were determined by calculating endurance indices - the difference between time to cover the distance of 3000 m, and time to cover the reference range (the average speed to cover the 1/10 of the whole distance). Development of coordination abilities was determined by Yarotsky test, involving evaluation of the state of vestibular analyzer with simple coordination and rotation tests disturbing vestibular receptors. In the complex evaluation of functional state of the body of a chess player during preparatory and competitive stages there were used indicators of heart rate, rate of respiration, and functional Shtange and Genchi tests. There were also used enquiries, questionnaires, tests, logging of personal achievements and Elo rating dynamics, and constructing progress charts in the preparatory and competitive stages of a mesocycle.

RESULTS AND THEIR DISCUSSION

The process of physical training of chess players is aimed to achieve an optimal physical state during the preparatory stage, the peak of which should coincide with the beginning of competitive activity. Sports people representing sports with high physical activity achieve their peak physical form 2-3 times per year. It should be noted that, unlike them, the highly qualified chess players who take part in competitions 8-12 times per year (9-12 days long at tournaments with classic time control) have a mesocycle about 1 month long, which is divided into a training (preparatory) and a competitive period. During the training period the level of physical preparedness and of functional state of the body reaches maximal physical load, with gradual decline in 2-3 days before the competition start, and remains the same during 5-7 days of the competition (the supercompensation phase of the restorative period). A. Y. Karpov stopped playing in large tournaments in 3 months before matches for the World Champion title, preferring instead psychological and physical preparation, and stopped playing chess at all in a week before the start. The level of physical fitness achieved beforehand lasts for about a week of competitions, and during the final stage of a tournament a need arises for small forms of physical activity (long walks, hydrotherapeutic procedures, massage, etc.) as means of recovery. The basic part of experimental method of physical training of highly qualified chess players during the preparatory period included mostly cyclic kinds of sports with high physical activity (walking, running, swimming, bicycling) for 40-45 minutes with 2 training sessions per day. The required condition for training load was that the heart rate must exceed 130 bpm.

The experimental method of physical training of highly qualified chess players, offered by a team of researchers, was based on the following principles:

- gradual increasing and waviness of amount of physical exercise;
- the proportioning of physical exercise must comply with the Federal Standard of Sports Training in Chess;
- achieving influence level of no less than 50% of basic physical qualities (endurance and coordination) of basic physical fitness during preparatory and competitive periods;
- consideration of personal preferences for the variable part in choosing the kind of physical activity for sportspeople chess players;
- unity of healthcare and pedagogical control, and of self-control.

It needs to be recognized that it is not always possible to fulfill the requirements of the basic part of physical training during the competitive period (because of limited access to sports facilities and being busy

preparing to a game with a rival), therefore compensation of physical activity deficit is achieved by long outdoor walks, performing morning gymnastics sequences, and by means of restorative forces of nature. The level of physical qualities and functional state achieved by physical training during the training period of the mesocycle is presented in Table 1.

Table 1. Dynamics of parameters during the training period of the mesocycle (n=14)

Physical quality or a functional test (units of measurement, scales)	Checkpoints (experimental time cross-sections, 1 per month)					
	I	II	III	IV	V	VI
Endurance index (t of a distance / t of a reference range)	28±0.3	27±0.1	28±0.1	27±0.0	26±0.4	25±0.2
Yarotsky test (t, sec)	32±2.4	38±0.7	36±1.2	41±1.7	43±2.3	45±0.1
Heart rate (bpm)	76±0.8	75±1.5	73±0.9	68±1.9	65±1.5	59±2.1
Shtange test (sec)	41.1	47.3	45.0	44.8	48.7	51.0
Genchi test (sec)	35.9	36.3	35.7	37.3	40.2	41.3
Rate of respiration (n, times per minute)	20.1	18.8	19.0	16.6	16.9	15.8

Forms of physical activity and kinds of sport facilitating the development of coordination (a physical quality, the second by influence level) which affects spatial awareness (basketball, table tennis, active games, etc.), are determined in the variable part according to personal preferences.

The level of physical qualities and functional state achieved by physical training and maintaining of physical activity during the competitive period of the mesocycle is presented in Table 2.

Table 2. Dynamics of parameters during the competitive period of the mesocycle (n=14)

Physical quality or a functional test (units of measurement, scales)	Checkpoints (experimental time cross-sections, 1 per month)					
	I	II	III	IV	V	VI
Endurance index (t of a distance / t of a reference range)	26±0.4	25±0.2	25±0.1	24±0.9	22±1.4	21±0.2
Yarotsky test (t, sec)	32±2.2	31±0.3	32±0.2	31±1	33±0.3	30±0.1
Heart rate (bpm)	66±0.7	65±0.5	73±0.9	69±0.9	71±2.5	73±2.1
Shtange test (sec)	41.1	39.3	40	42.8	43.3	44.0
Genchi test (sec)	35.9	36.8	37.7	37.3	37.2	37.8
Rate of respiration (n, times per minute)	18.3	18	17.2	18.2	18.4	17.8

CONCLUSION

Development and evaluation of the innovative method of physical education of highly qualified chess players during the preparatory and competitive periods of the mesocycle allow drawing the following conclusions:

1. Developing a complex of means, forms, and methods of physical training of chess players, as well as kinds and amounts of physical exercise, contributes to achieving the high level of physical fitness and development of physical qualities, which are necessary during training and competitive activity of highly qualified chess players.
2. During the physical training of sportspeople chess players a certain resistance level is reached, which persists for 5-7 days, and then the functional state of a chess player's body declines. Acquisition of this resistance level is predictable.

3. Active recreation is advised to highly qualified chess players during the competitive period of the mesocycle, facilitating positive dynamics of restorative processes.

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