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IMPLEMENTAÇÃO DE MODELOS DE POLÍTICA DE SAÚDE NA ADAPTABILIDADE DOS ESTUDANTES A VÁRIOS TIPOS DE ATIVIDADES FÍSICAS E ESPORTIVA

IMPLEMENTING MODELS OF HEALTH POLICY IN STUDENT ADAPTABILITY TO VARIOUS TYPES OF PHYSICAL EDUCATION AND SPORTS ACTIVITIES

NATALYA BELOUSOVA
South Ural State University of Humanities and Education, Russia. E-mail: belousova-natalia@bk.ru ORCID: https://orcid.org/0000-0001-9873-320X

NATALYA MAMYLINA
South Ural State University of Humanities and Education, Russia. E-mail: mamilinanv@cspu.ru ORCID: https://orcid.org/0000-0002-5880-439X

YULIA KORCHEMKINA
South Ural State University of Humanities and Education, Russia. E-mail: korchemkinayuv@cspu.ru ORCID: https://orcid.org/0000-0002-5864-8075

TATYANA SHULGINA
South Ural State University of Humanities and Education, Russia. E-mail: Shulginaov@mgpu.ru ORCID: https://orcid.org/0000-0001-7036-4035

NADEZHDA PERMYAKOVA
South Ural State University of Humanities and Education, Russia. E-mail: permyakovane@cspu.ru ORCID: https://orcid.org/0000-0002-2489-3072

RESUMO

Objetivo: Atualmente, a condição de saúde dos estudantes tende a deteriorar-se devido a sobrecargas emocionais, estresse informacional, estilo de vida irracional, presença de hábitos prejudiciais, etc. É possível interromper essa tendência negativa envolvendo-os em atividades de educação física e esportes de natureza preservadora da saúde em um ambiente preservador da saúde. O objetivo da pesquisa é desenvolver e testar a eficácia de modelos de adaptabilidade do estudante a vários tipos de atividades físicas e esportivas.

Métodos: A pesquisa foi conduzida em um grupo de voluntários para quem, com base no produto desenvolvido "Avaliação da Propensão para Especialização Profissional em Educação Física", foram dadas recomendações sobre a escolha do tipo de esporte levando em conta predisposições individuais (basquete, turismo, judô).

Resultados: Para os estudantes, modelos de adaptabilidade foram projetados e implementados para cada tipo de esporte com base nas características neurobiológicas do corpo, e sua eficácia e viabilidade de aplicação no processo educacional e de treinamento na universidade foram avaliadas.

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Conclusão: A implementação de nossos modelos de adaptabilidade levou a melhorias significativas nos jogadores de basquete (força muscular, capacidade de salto, função do processo nervoso), judocas (capacidade do sistema respiratório, equilíbrio nervoso) e turistas (resistência, equilíbrio do processo mental). Essas mudanças indicam o sucesso do nosso processo educacional e de treinamento, que otimiza as atividades físicas, cria um ambiente preservador da saúde e foca em conquistas pessoais e melhoria da saúde.

Palavras-chave: Ambiente Preservador da Saúde; Sistema Cardiorrespiratório; Basquete; Turismo; Judô; Predisposição Individual.

ABSTRACT

Objective: Currently, the health condition of students has a tendency to deteriorate due to emotional overloads, information stress, irrational lifestyle, presence of harmful habits, etc. It is possible to halt this negative trend by involving them in physical education and sports activities of a health-preserving nature in a health-preserving environment. The aim of the research is to develop and test the effectiveness of models of student adaptability to various types of physical education and sports activities.

Methods: Research was conducted on a group of volunteers for whom, on the basis of the developed product "Assessment of Propensity for Professional Specialization in Physical Education," recommendations were given on the choice of sports type taking into account individual predispositions (basketball, tourism, judo).

Results: For students, models of adaptability were designed and implemented for each type of sport based on the neurobiological characteristics of the body, and their effectiveness and feasibility of application in the educational and training process at the university were assessed.

Conclusion: Implementing our adaptability models led to significant improvements in basketball players (muscle strength, jumping ability, nerve process function), judokas (respiratory system capacity, nerve balance), and tourists (endurance, mental process balance). These changes indicate the success of our educational and training process, which optimizes physical activities, creates a health-preserving environment, and focuses on personal achievements and health enhancement.

Keywords: Health-Preserving Environment; Cardiorespiratory System; Basketball; Tourism; Judo; Individual Predisposition.

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INTRODUCTION

The implementation of innovations on the basis of the development of program means and modeling of physical education and sports activities of students will enable the optimization of the educational and training process in physical education at universities, increasing its safety and health-preserving component (Babaskin et al., 2024). One of the current tasks today is the implementation of measures to preserve and strengthen the health of students at different levels of education by involving them in physical education (Borodkin, 2023) and sports activities based on the diagnosis of individual sports predispositions (Belousova et al., 2022).

The most popular sports among students today are tourism (Belousova et al., 2023), team sports, and eastern martial arts (Akhmetshin et al., 2021). Physical education activities based on these types of sports allow students to successfully realize and form a conscious need for a healthy lifestyle, a valuable attitude towards their own health, and an increase in physical fitness levels. The design and implementation of models of adaptability of students based on the neurobiological characteristics of the body and optimally selected physical load contribute to the strengthening of the health of students (Omelchenko et al., 2022), increasing their motor activity, preventing fatigue, and increasing the resistance of the body to the influence of adverse factors of the internal and external environment (Gloria et al., 2024; KaiXing et al., 2024).

These positions predetermine the relevance of the problem of designing and implementing models of adaptability of students to various types of physical education and sports activities based on their individual sports predispositions, assessment of the functional state of the body using special program means with the aim of health improvement and strengthening in the process of education at universities.

Research goal – to develop and test the effectiveness of models of adaptability of students to various types of physical education and sports activities.

METHODOLOGY

In the research, 42 volunteer students aged 18-19 years, who regularly engage in physical education and attend sports sections (basketball, tourism, judo (at least 2 days a week)), participated. Anthropometric indicators were assessed: body length using a

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medical height meter and body mass using medical scales. Physical fitness indicators were assessed using special tests (vertical jump from a place with arm swing; Cooper test (running for 12 minutes)) (Belousova et al., 2021). The assessment of muscle strength of the hands and torso was carried out using a handgrip and deadlift dynamometer. The assessment of the speed of simple visual-motor reaction (SVR) and tapping test was carried out using the device "BioMouse research (KPF-01b)", intended for diagnosing the human condition. Additionally, indicators that characterize the general functional state of the body and are used as a general recommendation for sports were studied – these are physiometric indicators of the functional state of the cardiorespiratory system: respiratory volume, respiratory movement frequency, lung vital capacity, Stange and Genche tests.

RESULTS AND DISCUSSION

Using the previously developed program module "Assessment of Propensity for Professional Specialization in Physical Education," the diagnosis and analysis of anthropometric, physiometric, and neurophysiological indicators of students were conducted. Additionally, testing provided an assessment of the overall physical fitness of students. The result of the testing were recommendations for all students on engaging in a particular type of sport (basketball, judo, tourism). As a result, all students were divided into three groups: 1 – engaging in basketball (12 people); 2 – judo (14 people), 3 – tourism (16 people). For each group of students, we designed models of adaptability to various types of physical education and sports activities based on the studied physiological and neurobiological characteristics of their bodies.

The concept of adaptability is considered in various sciences: pedagogy, psychology, psychophysiology, economics, etc. (Duan, 2024). Yu.N. Mikhailova gives the following definition of adaptability from the perspective of psychophysiology: adaptability is "the ability of a person to carry out adaptive adjustments, adapt to changing conditions and the nature of activity; endurance, high work capacity, resistance to diseases and other external factors".

We identified the following components of adaptability: neurobiological, psychological (emotional), and educational-training (general and special physical

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training). Each of the components was assessed according to certain indicators (respiratory system, somatometric, psychological, psychophysiological, physical fitness), the degree of expression of which allowed us to identify levels of adaptability formation (low, medium, high) for students engaged in a certain type of sport. In the adaptive model we developed, there are target, content-diagnostic, and assessment-correction blocks, reflecting the social order, the goal, the program of forming adaptability of students to various types of physical education and sports activities in the educational and training process, components of the process, levels of adaptability formation of students, and obtained results. Block-by-block and component-by-component discussion of the modeled system allowed us to carry out a system analysis and system synthesis of the selected elements of the process of forming adaptability in relation to physical and health-improving activities and the manifestation of physical capabilities of students. For each type of sport (tourism, basketball, judo), we developed corresponding models of adaptability of students in the educational and training process, each of which focuses on the peculiarities of the training process in a particular sport, the peculiarities of creating a subject (training) environment, necessary physical qualities, equipment, safety measures, training load regimes, etc. Students engaged in physical education and sports activities should have sufficient indicators of all physical qualities, which should be developed comprehensively to master the necessary technical techniques. The model of forming adaptability of students to physical education and sports training through tourism, basketball, and judo will lead to a successful result when implementing its principles and conditions, which lie in the control and procedural block (Fedyaev et al., 2023; Khaupshev et al., 2018). The implementation of the models we developed was carried out during physical education classes and additional sessions twice a week throughout the academic year.

At the beginning of the academic year, priority indicators for each group of students and type of sport were defined: the average height indicators of basketball players were higher by 8.9% ($p<0.05$) and 7.3% ($p<0.05$) compared to judokas and tourists, respectively. Handgrip dynamometry indicators in basketball players were higher by 10.3% ($p<0.05$) compared to tourists and by 5.9% compared to judokas. Tourists showed significantly higher deadlift dynamometry indicators by 12.4% compared to basketball

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players and by 8.4% compared to judokas. In the research of the respiratory system indicators, the following results were obtained: tourists had a significantly higher respiratory volume by 14.5% compared to basketball players and by 16.1% compared to judokas. The lowest respiratory rate values were recorded in judokas, with tourists and basketball players being 6.3% and 10.8% higher ($p<0.05$), respectively. The highest lung vital capacity values were observed in students engaged in tourism, with basketball players and judokas having 7.4% and 11.2% lower values ($p<0.05$), respectively. Judokas held their breath on inhalation longer than anyone else, with the breath-holding time in tourists and basketball players being significantly less by 10.6% and 16.8%, respectively. A similar dynamic was observed in the results of breath-holding on exhalation (Genche test). Tapping test indicators were the lowest in tourists, with basketball players and judokas exceeding them in the range of 8-11%. Simple visual-motor reaction indicators were the lowest in basketball players, with tourists and judokas exceeding them in the range of 10-12%. In terms of jumping ability (vertical jump from a place with arm swing), basketball players naturally had the priority; the results of this test in judokas and tourists were significantly lower by 12.1% and 15.4%, respectively. Endurance and running speed indicators according to the Cooper test were highest in the tourist group, followed by basketball players; judokas covered the least distance in 12 minutes.

One of the important components of the educational and training process among students was the psychological (emotional) component, which was assessed using the Eysenck test (anxiety, frustration, aggression, rigidity). When assessing the level of anxiety, it turned out that judokas have the lowest indicators (on average 8.4±0.5 points); basketball players -12.6±0.8 points; tourists have the highest level of anxiety (15.6±0.9 points). Indeed, judo training promotes the coordination of mental processes, increasing their emotional stability, balance, and mental equilibrium. This is evidenced by the low level of frustration found in most judo students (on average 7.6±0.4 points), characterizing them as resistant to failures, having high self-esteem, not afraid of difficulties. The average level of frustration was found in most basketball players (9.8±0.7 points), and the highest indicators of frustration were recorded among tourists (due to a lower self-esteem, attempts to avoid difficulties rather than overcome them, fear of failure). When developing the model of adaptability of students to various types of physical education and sports

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activities for tourists, we took into account these neurobiological indicators, focusing on psychological preparation as an important component of the educational and training process with the aim of increasing confidence in the success of their own activities, reducing the degree of fear of failure situations, apprehension of not coping with the assigned task, and so forth. Therefore, the educational and training process for tourists should be based on the theory of subject-subject relations between the coach and the student, and also be built considering the principles of forming a psychologically comfortable and safe educational and training environment, which will significantly reduce the indicators of frustration (Ibragimova, 2023; Knyazeva Ibragimova, 2022).

A similar dynamic was observed in the indicators of aggressiveness and rigidity among the studied students. The lowest values were recorded in judokas, the highest – in tourists; most basketball players showed average levels of aggressiveness and rigidity. Judo training promotes the formation of calmness, endurance, easy switchability of nerve processes (balanced behavior). Tourists more often encountered episodes of imbalance, aggressiveness, difficulties in communication, a greater static nature of behavior, beliefs, views. In basketball players, as representatives of team sports, personal relationships are better established, they switch more easily to different paces of game activity depending on the situation on the playing field, but episodes of aggressiveness also occur quite frequently during games, especially in competitions. Therefore, when developing the model of adaptability of students to various types of physical education and sports activities for basketball players, we took these circumstances into account, focusing on forming a comfortable psychological climate in the team. In our view, the interaction between coaches and athletes should be structured in such a way that it simultaneously fosters the ability and readiness of the trainees to adequately perceive their own successes and failures, to correctly assess their achievements, thus attention should also be given to motivational work to enhance the effectiveness of the educational and training process overall, increasing its safety and health-preserving component.

For each sport, there is a specific mosaic of neurobiological, psychological, and physical (general physical preparedness and special physical training) indicators for the students involved (Khasin et al., 2023; Zvyagina, 2022). For basketball, significant indicators for students include body length; muscle strength of the arms (according to

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handgrip dynamometry); jumping ability (vertical jump from a place with arm swing); fast switchability, strength and mobility of nerve processes (according to the tapping test and simple visual-motor reaction); optimal levels of anxiety, frustration, aggression, and rigidity (Li et al., 2022; Ramadhan et al., 2023; Wu, Huang, 2023). For example, the tapping test results over 10 seconds not only assess the properties of the nervous system but also the speed of hand movements, which is crucial for basketball players, whose response speed largely determines the outcome of the game and competitive activity. Training reaction time is an integral part of the training process and a component of the psychological preparation of athletes in various sports, including basketball and judo (Fedyaev et al., 2023; Manolachi et al., 2021; Sinelnik, 2020).

A predominance of parasympathetic nervous system tone at rest due to more sophisticated autonomic regulation is characteristic of judokas (lower respiratory rate values, prolonged breath-holding times on inhalation and exhalation); the lowest indicators of anxiety, frustration, aggression, and rigidity, which indicates an increase in self-regulation of mental processes.

In tourism activities, priority is given to indicators of endurance and running speed (according to the Cooper test); enhanced reserve capabilities of the respiratory and cardiovascular systems (respiratory volume, lung vital capacity, etc.); muscular endurance of the torso (according to deadlift dynamometry). However, a greater imbalance of mental processes was identified among tourists compared to other sports (weak switchability, strength, and mobility of nerve processes due to elevated values of anxiety, frustration, aggression, and rigidity).

Following the implementation of the adaptability models we developed for each type of sport, significant improvements were observed in relevant indicators: in basketball players (muscle strength of the arms; jumping ability; switchability, strength, and mobility of nerve processes); in judokas (reserve capabilities of the respiratory system, balanced nerve processes); in tourists (general, muscular, and cardiorespiratory endurance against some leveling of the imbalance of mental processes). We consider these changes to be an indicator of the success of the educational and training process thanks to the implementation of our developed models, containing a wisely selected complex of exercises, organized with support from the requirements of psychology and pedagogy in

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the interaction of coaches with trainees, which allowed optimizing the physical education and sports activities of students, creating a safe, health-preserving environment, making it personally-oriented and focused on motivated achievement of high personal results and health enhancement (Uteshkalieva, Kumarova, 2021; Tsibulnikova, Khoptinskaya, 2020).

In organizing the physical education and sports activities of students, it is advisable to develop program means for the purpose of diagnosing individual sports predispositions for engaging in a particular type of sport, as well as creating a health-preserving environment, relying on neurobiological, psychological parameters of the body, as well as overall physical fitness (Ibragimova, 2023; Knyazeva, Ibragimova, 2022).

CONCLUSIONS

The research of indicators of individual sports predisposition of students allowed them to choose their preferred type of sports activity. The combination of anthropometric, physiometric, and neurophysiological indicators of the body creates the prerequisites and opportunities for successful physical education and sports activities of students, contributing not only to the improvement of their physical preparedness but also to the enhancement of their sports mastery, achieving high results in competitions. Moreover, with rationally organized physical education and sports activities, a stable health-preserving effect and result are possible. It is essential to note that thanks to the adaptability models we developed for students to various types of physical education and sports activities, the main focus for students is not on sports results, but on the vector of personal achievements (self-organization, correction of the regime of life activity, the ability to lead a healthy lifestyle, increasing mental self-regulation, mental and physical work capacity, etc.).

Engaging in the chosen type of sport in a health-preserving environment promotes the perfection of motor and physical qualities, the formation of stability and variability of motor skills, and the expansion of the reserve capabilities of the main energy-supplying cardiovascular and respiratory systems. The presented results prove the effectiveness and appropriateness of using specially developed program means in the educational and training process at universities to diagnose the sports predispositions of each student with the aim of creating an individual educational route in physical education.

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