InterAcción y Perspectiva
Revista de Trabajo Social
ISSN 2244-808X
D.L. pp 201002Z43506

Julio-Diciembre 2023
Vol. 13 No. 2

Facultad de Ciencias Jurídicas y Políticas
Centro de Investigaciones en Trabajo Social

Interacción y Perspectiva
Revista de Trabajo Social
Vol. 13 Nº2 232-242 pp.
Julio-diciembre

Dep. Legal pp 201002Z43506
ISSN 2244-808X

ARTÍCULO DE INVESTIGACIÓN

Turismo deportivo y estado psicofisiológico de los estudiantes

DOI: 10.5281/zenodo.7812202

Natalia Belousova *, Natalya Mamylina **, Yuliya Korchemkina ***,
Raisa Kovtun ****, Zemfira Bolshakova *****

Resumen

Los estudiantes universitarios son especialmente susceptibles de experimentar estrés psicológico y fisiológico debido a diversos factores, como las elevadas exigencias académicas, las cargas financieras, las limitaciones de tiempo, el aislamiento social y los cambios en el estilo de vida. Para enfrentar estos retos, las universidades tienen la responsabilidad de proporcionar a los estudiantes el apoyo y los recursos adecuados para gestionar el estrés y mejorar su bienestar. Los autores se propusieron investigar el impacto de las actividades de turismo deportivo en el bienestar físico y psicológico de las estudiantes universitarias. El estudio incluyó a 20 estudiantes universitarias de primer y segundo curso con edades comprendidas entre los 18 y los 20 años que participaron en un programa de Turismo Deportivo y de Salud que incluía actividades de acondicionamiento físico y entrenamiento psicológico, y que se prolongó durante dos años. Con el método de cronorreflexometría de variación se evaluaron los cambios en los parámetros que identifican el bienestar de las estudiantes, incluida la estabilidad de la reacción nerviosa, el nivel funcional del sistema nervioso y el nivel de capacidades funcionales del sistema funcional formado. Los resultados revelaron un aumento de las reservas funcionales del organismo de las estudiantes que participaron en actividades de turismo deportivo a lo largo de dos años. Indican la eficacia del programa para promover el bienestar físico y psicológico entre las estudiantes universitarias. Se recomienda el desarrollo de cursos electivos para programas de educación superior destinados a mejorar la salud y el bienestar general de los estudiantes.

Palabras clave: Turismo deportivo y de salud, Estado psicofisiológico, Sistema nervioso central, Estado funcional, Estudiantes.

Recibido: 15/03/2023 Aceptado:31/03/2023

* Departamento de Matemáticas, Ciencias Naturales y Métodos de Enseñanza de las Matemáticas y las Ciencias Naturales, Universidad Pedagógica Humanitaria Estatal de los Urales del Sur, Cheliábinsk, Rusia. ORCID ID: https://orcid.org/0000-0001-9873-320X. E-mail: belousova@cspu.ru
** Departamento de Seguridad de la Vida y Disciplinas Biomédicas, Universidad Pedagógica Humanitaria Estatal de los Urales Meridionales, Cheliábinsk, Rusia. ORCID ID: https://orcid.org/0000-0002-2326-651X. E-mail: mamilinanv@cspu.ru

*** Departamento de Informática, Tecnología de la Información y Métodos de Enseñanza de la Informática, Universidad Pedagógica Humanitaria Estatal de los Urales del Sur, Cheliábinsk, Rusia. ORCID ID: https://orcid.org/0000-0002-5864-8075. E-mail: korchemkinayuv@cspu.ru
**** Departamento de Pedagogía y Psicología, Universidad Pedagógica Humanitaria Estatal de los Urales del Sur, Cheliábinsk, Rusia. ORCID ID: https://orcid.org/0000-0001-8669-6819. E-mail: kovtunrf@cspu.ru
***** Departamento de Pedagogía y Psicología, Universidad Pedagógica Humanitaria Estatal de los Urales del Sur, Cheliábinsk, Rusia. ORCID ID: https://orcid.org/0000-0002-3232-4777. E-mail: zmb25@mail.ru

Abstract

Sports tourism and psychophysiological status of students

University students are particularly susceptible to experiencing psychological and physiological stress due to a variety of factors, such as high academic demands, financial burdens, time constraints, social isolation, and lifestyle changes. To address these challenges, universities have a responsibility to provide students with appropriate support and resources to manage stress and enhance their wellbeing. Aimed to investigate the impact of sports tourism activities on the physical and psychological wellbeing of female university students. The study involved 20 first- and second-year female students aged 18-20 years who participated in a Sport and Health Tourism program that included fitness activities and psychological training, and continued for two years. The researchers utilized the method of variation chronoreflexometry to assess changes in the parameters identifying the wellbeing of the students, including the stability of the nervous reaction, functional level of the nervous system, and the level of functional capabilities of the formed functional system. The findings of the study revealed an increase in the functional reserves of the organism of female students who engaged in sports tourism activities over the course of two years. Indicate the effectiveness of the program in promoting physical and psychological wellbeing among university students. This study can inform the development of elective courses for higher education programs aimed at enhancing the overall health and wellbeing of students.

Key words: Sports and health tourism, Psychophysiological status, Central nervous system, Functional state, Students.

Introduction

Students' learning activities are currently characterised by an increased information load, a large amount of independent work on the background of a sedentary lifestyle and high emotional tension. The efficiency of the educational process at university is related to the level of students' mental and physical performance. The totality of factors affecting students can be divided into three main groups: a) physiological (health, physical development, fitness, functional state of human body systems); b) physical (features of the microclimate of classrooms, degree and nature of lighting, air temperature, noise level, etc.); c) mental character (well-being, mood, motivation, character traits).

Engaging in sports activities has been shown to be an effective way to improve both physical and mental health, making it an important coping mechanism for students (Katashinskaya et al., 2019; Tarasova et al., 2019; Stukova et al., 2023). The current study focused on the positive impact of sports tourism, which was defined as an equivalent of sports hiking.

Sports hiking should be considered as an elective class for students due to the numerous benefits it offers for physical and mental health. Hiking is a form of low-impact aerobic exercise that can help improve cardiovascular health, muscular endurance, and bone density (Mansfield et al., 2016; Tinsley & Bassett, 2018). Additionally, hiking has been shown to promote mental wellbeing by reducing stress, anxiety, and depression, while increasing self-esteem and overall mood (Mansfield et al., 2016; Tinsley & Bassett, 2018). Therefore, hiking is an accessible and cost-effective way for students to improve their overall wellbeing and should be considered as a valuable addition to their elective class options.

One of the main advantages of hiking over other sports, particularly for females, is its accessibility and inclusivity. Hiking does not require any specialized equipment or skills, making it a cost-effective and easy-to-learn activity. Furthermore, hiking can provide a sense of empowerment and independence, as participants navigate trails and overcome physical challenges. This can be particularly empowering for females who may face gender-based barriers and stereotypes that limit their opportunities for physical activity and adventure (Mansfield et al., 2016; Tinsley & Bassett, 2018).

Sports hiking has a target function – sports excellence in overcoming natural obstacles. It means improvement of all complex of knowledge, abilities and skills necessary for safe movement of the person on a cross-country terrain, improvement of physical preparation for overcoming a complex natural terrain. There are the following main professional qualities for sports tourists: general and power endurance; considerable volume of operative memory; speed-force abilities; self-confidence; determination; emotional stability; fast and effective switching of attention; concentration of attention; spatial accuracy of movements; static and dynamic balance; static force; speed of complete motor action; temporary accuracy of movements; power accuracy of movements; speed of sustained motor. The practice of sports and health tourism places increased demands on the functioning of the students' nervous system and mental processes (Karvunis & Kapilevich, 2016; Komarov et al., 2019). Students harden their body, strengthen their health, develop endurance, strength and applied skills for orientation and self-care during hiking trips. Special conditions of tourist activity promote upbringing of moral qualities of the person (mutual aid, mutual support, responsibility, discipline, organizational qualities) (Syrovatko et al., 2021).

The functional state of the central nervous system (CNS) is determined by the properties of nervous processes, strength, equilibrium, mobility, which underlie the adaptation processes to student learning. Students characterized by sufficient strength and mobility of excitation and inhibition have not only good adaptation, but also significant success in learning in contrast to students with low indicators of mobility and

strength of nervous processes. Neurodynamic properties of nervous processes are estimated by integral indices of reaction time (Buduk-ool, 2019).

In light of the aforementioned approach, the primary objective of this study was to assess the impact of sports tourism training sessions on the psychophysiological health and wellbeing of university students. Specifically, the study aimed to evaluate the psychophysiological parameters of the students' organism under the combined influence of educational loads and tourism training sessions. Through these assessments, the study sought to develop a comprehensive understanding of the effects of the combined impact of educational loads and sports tourism training sessions on the health and wellbeing of university students.

Materials and methods of research

The study involved 20 first- and second-year female students aged 18-20 years at South Ural State University of Humanities and Education (Russia). Prior to the examination, all participants in this study reported no health-related complaints, exhibited no signs of somatic pathology, and maintained a normal body weight. All participants were actively enrolled in the Sport and Health Tourism program offered by the university's subdivision. The program consisted of sections covering general, special, and psychological training.

The level of the functional state of the CNS and efficiency was estimated by the method of variation chronoreflexometry including determination of the stability of the nervous reaction (SR), functional level of nervous system (FLS) and the level of functional capabilities (LFC) of the formed functional system (Moroz, 2009). The chosen method realized as a computer program based on statistical analysis of latent periods of a simple sensorimotor reaction is simple and convenient in use. It enables fast data collection and processing and is used as an express-method in applied studies on estimation of human functional states.

Statistical processing of the study results was performed using Excel 2016 and STATISTICA 8.0 with calculation of t-test for dependent and independent samples. The mean (X) and error of the mean (m) were calculated, differences were considered significant at $p<0.05$.

Results and discussion

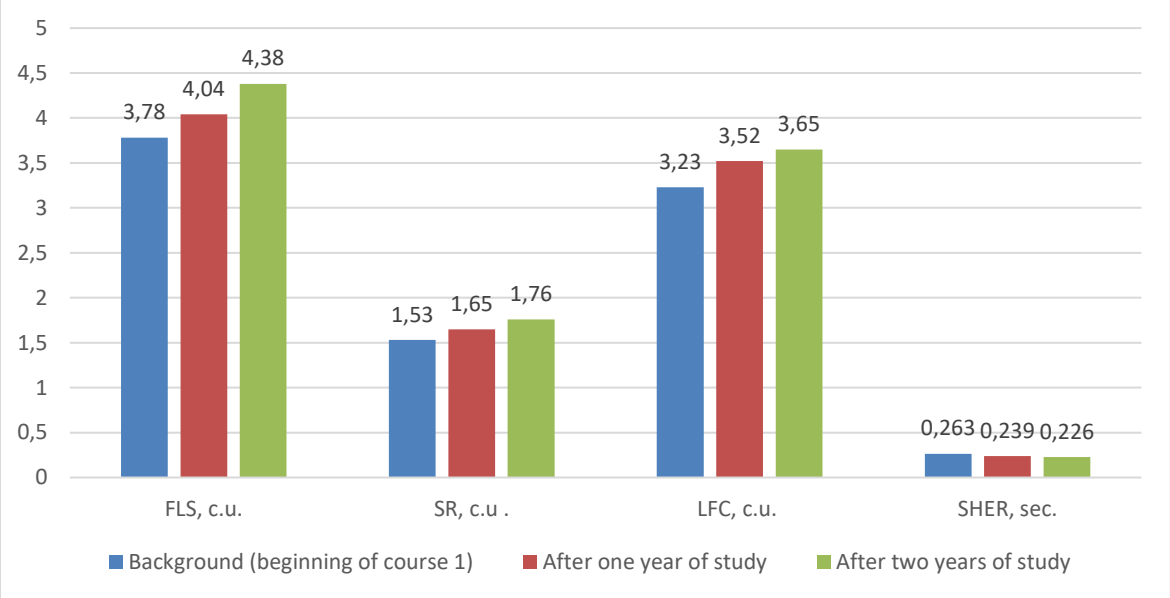
The CNS regulates the activity of all organs and systems of the organism, ensures its adaptation to the complex of factors of external and internal environment, controls all mental processes. In the practice of sports and health tourism psychological preparation is of great importance, a tourist must have psychological stability, attention, volitional qualities, diligence, endurance. The special attention is given to endurance of nervous system, analytical-synthetic activity of a brain as it is necessary to overcome difficult routes, to be able to be clearly guided on district, to choose optimum ways of

movement, etc. (Efimova & Mylnikova, 2015; Nikishin et al., 2018). In addition, the learning process in higher education is characterized by the receipt of a significant amount of information, an increase in the daily and weekly training load, which is accompanied by the emergence of neuro-psychological stress and the possibility of stressful situations in students. This has a significant impact on the CNS.

Below presented the results of the tests of the functional state of students' performance during training and sports (Figure 1).

Figure 1

Indicators of the functional state of the CNS of students engaged in sports and recreational tourism in the dynamics of two years



Note: FLS – system functional level; SR – response stability; LFC – level of functional capabilities; SHER – latent period of simple hand-eye response

Source: Authors development

When the functional state of the organism decreases, the timing of individual reactions increases significantly. It is believed that the variation characteristics of motor reaction times reflect the probabilistic-statistical principle of brain functioning. The form of the distribution of successive values of the SHER time and the position of the variation curve in the coordinate system vary according to changes in the functional state of the CNS. This correspondence allows to define three quantitative criteria characterizing from different sides theoretically possible variants of the curve forms and, hence, reflecting

different sides of the CNS functional state as well as levels of work capacity (Moroz, 2009).

The evaluation of the functional state of the CNS is based on the analysis of the level and stability of sensorimotor reactions of female students in response to light stimuli. The value of the functional level of the system (FLS) is determined by absolute values of reaction time, mainly by absolute values of latent period of simple hand-eye response, i.e. the position of the variation curve relative to abscissa.

When assessing the functional state of the CNS in students at the beginning of the first course, which is determined by absolute values of reaction time, we found that the average values correspond to 3.78±0.14, which is almost characteristic of an insignificant decrease in the level of performance. This condition occurs at the initial stage of fatigue development. FLS after one year of training and sporting activities increased in relation to the background by 7.0%; after two years by 16.0% ($p<0.05$). The increase in FLS in the dynamics of two years of tourism training indicates the mobilization of body reserves to maintain the functional level of the nervous system. Decrease – about the possibility of depletion of reserve opportunities under the influence of intensive work. So, according to M. P. Moroz (2009), in norm the functional level of nervous system should be from 4,9 to 5,9 c.u.; the level of 3,8-4,8 c.u. corresponds to a condition "work capacity insignificantly lowered"; borders of a condition "lowered work capacity" are in limits 2,0-3,7 c.u.

Nervous reaction resistance (NR), reflecting the variability of reaction time values, at the beginning of the first course (background level) in students was within the physiological norm; after one year of training and sports activities increased in relation to the background by 8.0%; after two years – by 15.0%. This indicates an increase in the stability of the students' nervous system under the influence of tourism studies in the dynamics of the training process. As it is known, a decrease in NR indicates the existing fatigue of the nervous system. The value of this index is the greater, the smaller is the dispersion of reaction time, the smaller is the variability of latent period of simple hand-eye response values, i.e. it is oriented on ordinate. Since the variability of latent period of simple hand-eye response values is associated with continuous fluctuations of the CNS states, the NR index is considered to be a criterion of stability of the CNS states.

The most comprehensive criterion is the level of functional capabilities (LFC), which allows to judge the ability to form a functional system adequate to the task and to maintain it for a sufficiently long time. This criterion is the most complete characteristic of the state of the CNS, its ability to form a functional system that implements a particular human activity. LFC at the beginning of the first course (background level) was within the physiological norm; after one year of training and sports training increased in relation to the background by 9.0%; after two years – by 13.0%. These values characterize the adequate response of the students' nervous system to emotional stresses during the learning process.

One of the most informative techniques for assessing a person's functional state is determining the latent period of the simple visual-motor reaction, which characterizes

the temporal parameters of the nervous processes that are the main ones in psychomotor actions of a person. The simple sensorimotor reaction is realised through the formation of a functional system, the operation of which depends on the coherence, synchronism of temporal and spatial parameters of this system and the coincidence of excitation rhythms in nerve cells. An increase in the latent period of the simple visual-motor reaction indicates an increase in the time of perception and processing of information. A decrease in the latent period of the reaction corresponds to an increase in the functional state of the nervous system. Simple visual-motor reaction time is one of the most important integral measures of speed. It is the speed of excitation along the central link of reflex arc that is the marker of excitability and lability of CNS, the adequate indicator of the functional state of the nervous system. Reaction time is the interval between the beginning of a stimulus and the beginning of a response, usually a motor response (Baiguzhina et al., 2020). The concept of "latent period" is used to explain brain processes responsible for reaction time. The latency period is a characteristic of the psychophysiological process, which represents the time between the beginning of a stimulus and the emergence of a response. The latent period is caused by a physico-chemical process in a receptor, the passage of a nerve impulse through conductive pathways, analytical and synthetic activity in brain structures, and muscle actuation. The latent period can vary significantly in its value depending on the modality and intensity of the stimulus, on the level of complexity and automatization of the reaction, and on the functional readiness of the nervous system. The response time to a stimulus cannot be lower than a certain physical limit, or "irreducible minimum", which is about 100 ms (Litovchenko & Arent, 2007). Latent time is important for monitoring the functional state of the CNS and a decrease in the reaction rate indicates a decrease in the functional activity of the CNS. Significant shortening of the latent period of reactions does not always correspond to an increase in the functional level of the CNS, especially after any stress, e.g., in weak excitable types of higher nervous activity it is associated with disinhibition and imbalance of the nervous processes. A decrease in the speed of sensorimotor response may be considered not only as fatigue to the load, but also indicate a more economical type of nervous system, which regulates through protective inhibition (Buduk-ool, 2019).

The latent period of simple visual-motor reaction in students at the beginning of the first year (background level) was within the physiological norm; after one year of training and sports activities decreased in relation to the background by 9.0%; after two years – by 14.0%. This indicates a decrease in the time of perception and processing of information in students in the dynamics of sports and recreational tourism. Exercise in sports contributes to the reduction of fatigue and improvement of mental performance of students.

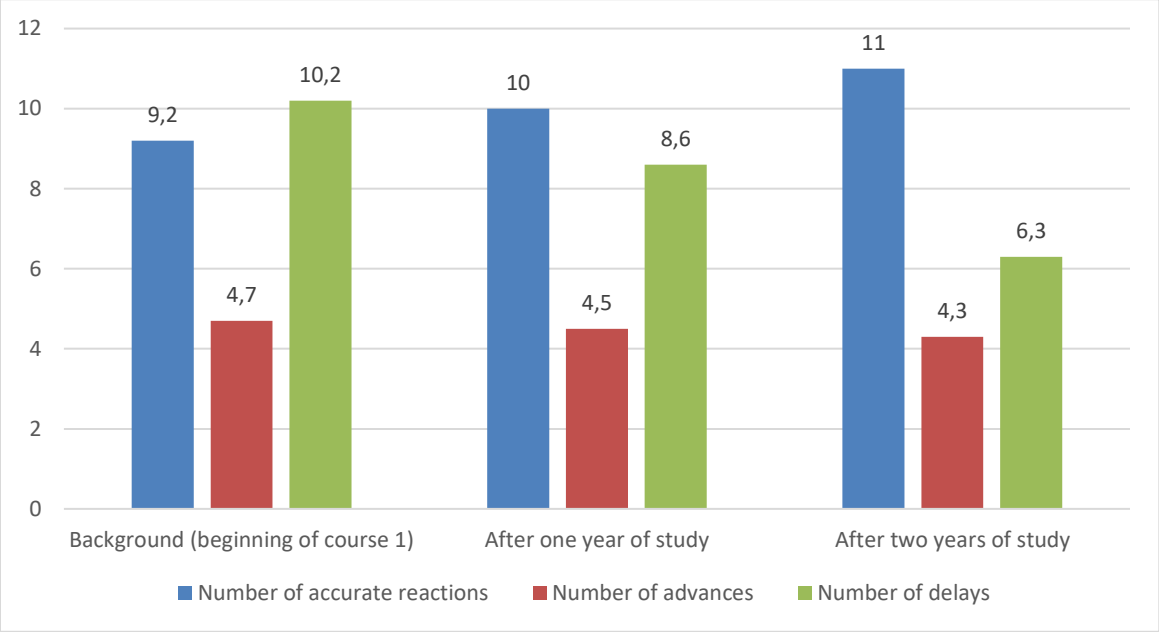
The study of the functional level of the students' CNS in the dynamics of tourism training revealed a change in the state of work capacity in all three integral indices towards its increase.

The reaction to a moving object (RMO) belongs to complex sensorimotor reactions and is widely used in the analysis of temporal and spatial indicators of motor reactions,

in particular, it characterizes the level of visual attention, accuracy of task performance, as well as takes into account emotional tension. RMO is a spatio-temporal reflex determining the equilibrium of excitation and inhibition. The results of the RMO were processed by comparing the number of leading and lagging reactions according to Maslova et al. (2005), the results are shown in Figure 2.

Figure 2

Reaction to a moving object test scores of health and fitness tourism students over the course of two years



Source: Authors development

The number of accurate reactions in students at the beginning of the first year (background level) was 9.2±0.4; after one year of training and sporting activities increased in relation to the background by 9.4%; after two years – by 19.6%. The predominance of delayed responses over anticipatory ones at the beginning of the first year of training indicates an imbalance in the nervous processes of excitation and inhibition in the CNS of students. The number of leading responses tended to decrease over the course of two years. The number of lags after one year of training and sport decreased in relation to the background by 15.7%; after two years by 38.2%. This indicates an increase in the equilibrium of the nervous processes of excitation and inhibition in the CNS of students under the influence of regular training in the sport and health tourism section.

Conclusions

In the process of adaptation of the human body to the factors of learning load and muscular activity, a complex mechanism aimed at maintaining performance is triggered. The CNS is considered to be the main centre for the formation of adaptation programmes (Mulik et al., 2019; Tamozhnikova et al., 2021). Therefore, it is the study and assessment of the functional state of the CNS that can provide information on the processes of interaction between multiple functional systems during learning and training activities. Comparison of values of calculated criteria for evaluation of CNS functional state with values of work capacity levels allowed us to determine that the functional state of students' CNS at the beginning of the first year of study was at the level of reduced and slightly reduced capacity. Such state is characterized by impaired attention, sharp deterioration of temporal and precise activity parameters and a significant decrease in performance in general. The increase in the functional state of the CNS of students in the dynamics of tourism training testifies to the increase in stability of reaction, functional capabilities of information processing, adaptive resources of nervous system.

The above dynamics of the indicators of the nervous system indicates an increase in the functional reserves of the organism in girls during two years of additional training in sports. Systematic and moderate physical exercises in the afternoon, exceeding the volume of physical loads planned in the curriculum of the university, improve energy supply, increase adaptive resources of the organism. Under the influence of systematic physical activity in the body develops a complex of structural and functional changes. A major role in this process is played by the nervous system, the optimization of which functioning is a prerequisite for sportsmen to achieve high results (Petrenko et al., 2021).

Bibliographic references

- Baiguzhina, O. V., Shaposhnikova, M. V., Komissarova, O. A., & Nikolskaya O. B. (2020). "Neurodynamic predictors of motor reaction accuracy". **Human. Sport. Medicine**, 20 (S2), 26-30.
- Buduk-ool, L.K. (2019). "Screening-analysis of gender differences in the functional state of the nervous system of Tuvinian students". **Vestnik of Tuva State University. Natural and Agricultural Sciences Series**, 2 (45), 5-12.
- Efimova, N. V., & Mylnikova, I. V. (2015). "Specific features of the psychophysiological status in adolescents with different intensities of sporting hours". **Human Physiology**, 41 (1), 70-74. https://doi.org/10.1134/S0362119715010053
- Karvunis, Y. A., & Kapilevich, L. V. (2016). "Basics of sports and health tourism: Optional school course efficiency rating". **Theory and Practice of Physical Culture**, 12, 29.

- Katashinskaya, L. I., Gubanova, L. V., Ermakova, E. V., Kadyseva, A., & Tsalikova, I. (2019). "Dynamics of psychophysiological characteristics and physical preparedness of students of physical training faculty of pedagogical university". **Human. Sports. Medicine**, 19 (4), 29-36. https://doi.org/10.14529/hsm190404
- Komarov, M. N., Zavalishina, S. Y., Karpushkin, A. A., Malyshev, A. V., & Kumantsova, E. S. (2019). "Rehabilitation potential of physical activity complex with elements of sports and health tourism in case of dysfunction of the cardiovascular system in adolescence". **Indian Journal of Public Health Research and Development**, 10 (10), 1814-1818.
- Litovchenko, O. G., & Arent, E. A. (2007). "Chronoreflexometric characterization of work capacity of middle-aged residents from 7 to 20 years old". **Modern Science-Intensive Technologies**, 11, 24-28.
- Mansfield, C. F., Beltman, S., Broadley, T., & Weatherby-Fell, N. (2016). "Building resilience in regional youth through outdoor adventure education". **Journal of Outdoor and Environmental Education**, 19 (1), 25-37.
- Maslova, O. I., Goryunova, A. V., Gur'eva, M. B., Balkanskaia, S. V., Dneprova, L. I., & Golovkina, I. D. (2005). "Test computer systems in the diagnosis of cognitive disorders as observed in the syndrome of attention deficiency with hyperactivity in children". **Biomedical Engineering**, 1, 7-13.
- Moroz, M. P. (2009). **Express-diagnostics of human performance and functional state. Recommendations for admission to work: A methodical guide**. St. Peterburg: IMATON, pp. 48.
- Mulik, A. B., Postnova, M. V., Nazarov, N. O., Ulesikova, I. V., & Shatyr, Yu. A. (2019). "Gender-specific socio-psychological and psychophysical profiles of indigenous sporting versus non-sporting groups". **Theory and Practice of Physical Culture**, 9, 14.
- Nikishin, I. V., Galochkin, P. V., Matveyev, A. E., & Shvetsov, A. V. (2018). "Students' psychophysiological indicators versus physical activity". **Theory and Practice of Physical Culture**, 4, 26.
- Petrenko, O. V., Nerubenko, L. A., Sulima, T. V., & Nesterenko, G. L. (2021). "Track and field athletics elite: Discipline-specific psychomotor tests and analysis". **Theory and Practice of Physical Culture**, 6, 24-26.
- Stukova, E. A., Byankina, L. V., Manikovskaya, M. A., Galitsyn, S. V., & Byankin, V. V. (2023). "Implementation of the principle of consciousness and activity in the process of training young sambo wrestlers as the embodiment of harmony between body and spirit". **Retos**, 47, 887–892. https://doi.org/10.47197/retos.v47.93487
- Syrovatko, Z. V., Yefremenko, V. M., Anikeienko, L. V., Bilokon, V. P., Korol, S. M., Riabchenko, V. G., & Koshel, V. M.(2021). "Strengthening students' health in

the process of sports and health tourism engagement". **Wiadomosci Lekarskie**, 74 (6), 1478-1484. https://doi.org/10.36740/wlek202106135

- Tamozhnikova, I. S., Tamozhnikov, D. V., Anuchin, D. S., & Sklyarova, N. V. (2021). "Visual-motor reactions as an indicator of functional state of the central nervous system of students of different sport specializations". **Theory and Practice of Physical Culture**, 7, 109.
- Tarasova, O. L., Kazin, E. M., Skotnikova, L. N., Igisheva, L. N., & Igishev, N. V. (2019). "Motivations for physical activity and their contribution to adolescent adaptive psychophysiological potential". **Theory and Practice of Physical Culture**, 9, 13.
- Tinsley, H. E., & Bassett, D. R. (2018). "The importance of exercise in the lives of college students". **American Journal of Health Education**, 49 (2), 67-74.