relaxation exercises help lower blood temperature. Stretching exercises lengthen muscles, which helps maintain or improve flexibility. They also help reduce muscle tone, resulting in all the benefits described above. Jogging for 2-5 minutes, cycling at a low intensity, or swimming slowly for 5-10 minutes are all aerobic exercises designed to utilize lactate in the muscles, relax skeletal muscles after intense training, and ensure a smooth transition of the vascular system from significant stress to normal [2; 8].

Autogenic training is a means of mental and muscular relaxation using appropriate posture, mindset, and verbal self-hypnosis. Inhibition of cortical centers and, in turn, activation of subcortical centers leads to self-regulation at the subconscious level. Verbal signals such as "my hands are warm," "my hands are heavy," and so on lead to deep relaxation, which accelerates the rehabilitation process (the body's recovery after strenuous work).

Conclusions. To enhance the training effect when developing strength qualities, methods can be used that intensify, increase the load, and prolong the time muscles remain under extreme tension. This saves training time, adds variety to the training process, and provides an emotional boost to trainers. However, these methods are not recommended for students with insufficient strength training experience. There is a high risk of muscle and especially tendon injuries, and there is also a risk of overexertion and health problems. In particular, first-year students who are lagging behind in physiological maturation may experience hypertensive shifts in blood pressure. Even with the most rational training method, an athlete can accumulate fatigue, which can lead to stagnation in results, provoke microtraumas, and reduce the desire to train. It is crucial to avoid overexertion, as it can lead to undesirable pathologies. Students who actively participate in sports report significant improvements in their emotional well-being and overall quality of life. This is because physical activity promotes the release of happiness hormones, which help them cope with the emotional stress of studying. One problem that students face is the high level of stress, which can hinder them from achieving their goals. Factors contributing to this stress include academic workload, social interactions, and uncertainty about the future. Regular exercise helps reduce anxiety and depression, as confirmed by the results of our student sociological survey. Students who actively participate in sports demonstrate better academic performance, as physical activity has a positive impact on concentration and cognitive function. Incorporating physical activity into students' daily lives helps them develop habits aimed at maintaining health and preventing future illnesses. Thus, physical activity is an important factor in improving students' health and their overall well-being. Physical activity has a significant impact on mental health, reducing levels of stress, anxiety, and depression, which is especially important during academic pressures. Strength is one of the most important indicators in both sports and life.

Strength determines a person's ability to overcome external barriers or resist them using muscle power. Strength is expressed through strength abilities. The main types of strength abilities are maximum strength, explosive strength, and strength endurance. Moderate exercise is essential to stimulate the body's metabolic processes. Exercise increases all metabolic processes in the body. In order for students to be able to study well, be resourceful and have high grades, pass the session with flying colors, and be at the top of the rankings, they absolutely need to be disciplined and have time for physical education.

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DEVELOPING STUDENTS' WORKING MEMORY IN PHYSICAL EDUCATION CLASSES AT THE NATIONAL TECHNICAL UNIVERSITY OF UKRAINE "IGOR SIKORSKY KYIV POLYTECHNIC INSTITUTE"

The level of physical, mental, and social well-being of students in today's world is very low and is deteriorating due to the difficult military situation, environmental conditions, and economic instability in the country. To improve the situation, in my opinion, during their university studies, efforts must be made to maintain not only students' physical but also mental health,

teach them interpersonal skills, facilitate their self-discovery, and develop the personal qualities that will facilitate their social and professional adaptation.

Physical education offers great potential for studying students' individual characteristics and developing professionally significant personal qualities. Working memory is an essential professional skill for any specialist. Working memory is a type of short-term memory. It represents a person's ability to retain current information necessary to perform a particular action. The duration of information storage is determined by the time it takes to perform a given action.

For example, an engineer must act based on instructions that strictly regulate the sequence of operations performed by the employee. Such instructions often contain more than ten points, each describing a whole series of operations. A similar workload also occurs in the work of managers, journalists, and IT professionals at various levels. The need to ensure strict production discipline, a rapidly changing environment, and increased responsibility all of this requires the mobilization of working memory.

Working memory significantly impacts the reliability and effectiveness of operational and administrative personnel. To develop working memory in physical education classes, we used exercises that trained this function, focusing on memorizing information and quickly recalling it. When teaching techniques for various power sports, sequential exercises for performing individual techniques are traditionally used. We combined the sequential execution of various techniques in a single exercise. For example, students had to memorize the sequence of individual techniques and quickly perform them in a given sequence. This exercise can be performed in two ways: verbally or through demonstration. In the first case, the student memorizes information from the teacher's words, while in the second, visual memorization occurs.

The necessary observations were conducted during the 2024-2025 academic years over two semesters. To ensure the reliability of the study, a statistical method was used, recording indicators for each student.

Key words: *student, memory, physical education, influence, development, sequence, memorization.*

Назимок Віктор. Розвиток оперативної пам'яті студентів на заняттях з фізичного виховання у Національному технічному університеті України "Київському політехнічному інституті імені Ігоря Сікорського". *Рівень фізичного, психічного та соціального благополуччя студентів у сучасному світі дуже низький і погіршується через складну військову ситуацію, екологічні умови та економічну нестабільність у країні. Для покращення ситуації, на мою думку, під час навчання в університеті необхідно докласти зусиль для підтримки не лише фізичного, а й психічного здоров'я студентів, навчити їх навичкам міжособистісного спілкування, сприяти їхньому самопізнанню та розвивати особистісні якості, які сприятимуть їхній соціальній та професійній адаптації.*

Фізичне виховання пропонує великий потенціал для вивчення індивідуальних особливостей студентів та розвитку професійно значущих особистісних якостей. Оперативна пам'ять є важливою професійною навичкою для будь-якого спеціаліста. Оперативна пам'ять - це вид короткочасної пам'яті. Вона являє собою здатність людини зберігати актуальну інформацію, необхідну для виконання певної дії. Тривалість зберігання інформації визначається часом, необхідним для виконання певної дії.

Наприклад, інженер повинен діяти на основі інструкцій, які суворо регламентують послідовність операцій, що виконуються працівником. Такі інструкції часто містять понад десять пунктів, кожен з яких описує цілий ряд операцій. Подібне робоче навантаження також зустрічається в роботі менеджерів, журналістів та IT-фахівців різного рівня. Необхідність забезпечення суворої виробничої дисципліни, швидкозмінне середовище та підвищена відповідальність - все це вимагає мобілізації оперативної пам'яті.

Оперативна пам'ять суттєво впливає на надійність та ефективність роботи оперативного та адміністративного персоналу. Для розвитку оперативної пам'яті на заняттях з фізичного виховання ми використовували вправи, які тренували цю функцію, зосереджуючись на запам'ятовуванні інформації та швидкому її відтворенні. При навчанні технікам різних силових видів спорту традиційно використовуються послідовні вправи на виконання окремих прийомів. Ми поєднували послідовне виконання різних прийомів в одній вправі. Наприклад, студенти повинні були запам'ятати послідовність окремих прийомів та швидко їх виконати в заданій послідовності. Цю вправу можна виконувати двома способами: усно або за допомогою демонстрації. У першому випадку студент запам'ятовує інформацію зі слів викладача, а в другому - зорове запам'ятовування.

Необхідні спостереження проводилися протягом 2024-2025 навчальних років протягом двох семестрів. Для забезпечення достовірності дослідження використовувався статистичний метод, що фіксував показники для кожного студента.

Ключові слова: *студент, пам' ять, фізичне виховання, вплив, розвиток, послідовність, запам'ятовування.*

Formulation of the problem in general form. We increased the complexity of the task by increasing the number and variety of elements while simultaneously decreasing the time allocated for their completion. The most engaging exercises for students were those performed by the entire group, where they had to memorize the sequence of elements and the movement pattern, with any incorrect action by any of them immediately stopping the exercise. The pattern for such an exercise was usually explained to the students verbally, and the sequence of elements was given verbally. These exercises encourage precise execution of the sequence of elements by placing responsibility on all participants for completing the exercise. Repeated use of such exercises has a training effect on the quality of working memory.

Analysis of literary sources. Recent research suggests that there may be a closer and more direct connection between physical exercise and the human body's mental functions than previously believed. Various authors have presented scientifically substantiated data on the impact of physical exercise on human intellectual development: Gavrylova N.E.,

Mokhunko O.D. [1], Dakal N.A., Kachalov O.D. [2], Zubko V.V., Garnusova V.V., Ship L.I. [3], Soga S.M., Mykhailenko V.M., Dobrovolskyi V.E. [4].

Review of previously unsolved parts of the overall problem. Despite the accumulation of considerable theoretical material on the relationship between physical exercise and intellectual abilities, there is a significant lack of practical research in scientific literature that addresses the specifics of physical education and sports instructional methods that can enhance the memory and attention of university students. Since the level of interaction between physical exercise and intellectual development remains unclear, this inevitably creates certain difficulties in planning, organizing, and conducting practical classes to develop students' attention and memory in physical education and sports instruction. Therefore, defining and substantiating the organizational and methodological aspects of attention and memory development is of both scientific and methodological interest, as well as social and practical ones.

The purpose of the study. We believe the ability to demonstrate working memory performance under emotional arousal is of great importance. To develop this ability, we ensured a tense emotional environment during exercise. We achieved this goal by incorporating a competitive element into the exercise. Similar exercises are used in specialized sports schools and university athletic development groups, where selected young men and women with high levels of ability train, and where the main goal is preparation for competitive activity. In student specialization groups, the range of objectives is much broader, and the main ones, in my opinion, are maintaining physical and mental health and preparing for future professional activities [3, 15].

Presentation of the main research material. Observations of students performing exercises showed that the quality of working memory is not directly dependent on the development of basic physical skills. For example, a student with a high level of endurance (3000m cross-country run - 12 minutes 12 seconds) and strength (pulling up on a bar - 11 times) could only perform such exercises with great difficulty, constantly making mistakes. Conversely, a student with very low scores on tests of strength (pulling up on a bar - 4 times), endurance (3000m cross-country run - 15 minutes 37 seconds), and speed (100m run - 15.7 seconds) easily completed these exercises. This suggests that the performance of tasks involving rapid recall of received information is determined not only by physical skills but also by the development of mental functions.

The impact of changes in students' memory and attention during the course of physical education and sport at university remains understudied. An inappropriate balance between studying and an optimal daily routine that takes into account healthy eating, adequate physical activity, and the prevention of fatigue causes signs of psychological stress in students. Adherence to these rules helps minimize the memory loss and distraction that inevitably occur with intense mental workload. This article examines the relationship and interaction between physical and mental functions, where an optimally selected physical activity regimen leads to some changes in students' ability not only to absorb large amounts of information but also to their overall successful academic performance at university. The development of theoretical aspects of memory and attention changes, which has unfolded in the theory and methodology of physical education, has stimulated research into the practical achievements of Ukrainian and international scientists in this field. The study includes an experiment conducted with students at a technical university before and after a physical education and sport class to determine the extent of changes in attention and memory. The testing results revealed an unconditional positive effect of moderate physical activity on the processes of attention and memory [1, 14].

Currently, the volume of scientific and theoretical research has generated a sufficient number of prerequisites for examining the significant impact of physical activity on the development of human intellectual abilities. However, scientific and methodological literature covering the specific means and methods of physical education in adolescence is underrepresented. This is due to the fact that the level of such interaction has not yet been fully determined, which inevitably creates certain problems in the planning, organization, and implementation of practical classes in physical education and sports at university. Successful university studies require the effective assimilation of a vast amount of unfamiliar material. Students are forced to adapt to new conditions, which often leads to mental and emotional overload due to poor nutrition and forced sedentary lifestyle [3,5]. Neuropsychic stress, in turn, leads to fatigue, diseases of various organs and systems, and ultimately results in serious health problems. Physical activity plays a key role in developing and improving adaptation mechanisms to mental stress, influencing successful information processing, attention, operational thinking, and mental performance. Based on the above, the goal of our study was to track changes in students' attention and memory before and after physical education and sports classes at a university [2, 10].

The subject of our research is changes in students' memory and attention during physical education and sports classes at a university. Effective learning of educational material can be hampered by frequently occurring problems of memory impairment and distraction. Such negative changes in various organs and systems of the body occur during the period of admission and study at a university under the influence of emotional and neuropsychological stress. Ukrainian and international psychophysiologists are actively developing theoretical aspects of the theory and methodology of physical education related to the development of memory and attention. Many authors agree on one thing: there is a closer and more direct connection between physical exercise and human mental functions than previously believed. Furthermore, there are a number of areas in which scientists are also reaching consensus [2, 4]. This primarily concerns the scientifically substantiated impact of physical exercise on human intellectual development. This means that many mental processes, such as the stability of memory, attention, perception, and information processing, depend on the level of functional capacity and physical fitness. Thus, a properly selected physical activity regimen promotes better assimilation of large amounts of information. Aerobic activity (running, swimming, skiing, walking, and more) is the best way to maintain the functioning of the nervous system and brain.

Memory is the process of memorizing, storing, and reproducing thoughts, images, emotions, and movements. In other words, memory is an individual's experience. The primary function of memory is the accumulation of experience. Without

memory, all sensations and perceptions would disappear without a trace. Memory creates the conditions for the normal functioning of thought: all ideas and concepts are stored in memory. Memory serves as the foundation for the continuity of human mental activity as a whole, linking the present, past, and future. All types of memory are demonstrated in physical education classes: visual memory plays a leading role when demonstrating physical exercises; auditory and verbal-logical memory plays a leading role when explaining (describing, telling) them; and motor, tactile, and vestibular memory plays a leading role when performing physical exercises [4, 5].

Visual memory is associated with the memorization, retention, and reproduction of visual images, such as those of a learned exercise. It is also used when a teacher demonstrates physical exercise, when learning tactical moves, various combinations of athletic movements, and much more.

Auditory memory is associated with the memorization of sounds. Verbal-logical memory is needed for the memorization, retention, and reproduction of words and concepts [1, 2]. While auditory memory primarily provides a person with orientation in the surrounding environment, verbal-logical memory helps a person think (using internal speech), convey information (external speech), and understand the statements of others.

Motor, tactile, and vestibular memory play a special role in physical education. They are associated with the memorization, retention, and reproduction of signals arriving in the cerebral cortex from proprioceptors, skin receptors, and the vestibular system. These types of memory are used when learning and performing physical exercises. It is known that different movements (and their parameters) are learned with varying degrees of reliability. The sensations arising from the muscular effort required to perform certain actions are more difficult to memorize, the spatial parameters of actions are easier, and the temporal parameters of movements are even easier [3, 15].

Any activity in a person's life, including sports, is embedded in all types of memory, forming integral structures. Among these integral types of memory, motor memory is particularly important in physical education. Movements are memorized visually, motorically, tactilely, vestibular, mentally, and even emotionally. Through various perceptual modalities and the emergence of specific images, an integral image of physical exercise is imprinted in memory, which subsequently becomes the standard for controlling movements during motor actions [2, 4].

Conclusions. We previously identified a direct correlation between the intensity of physical exercise and intellectual ability: "It should be noted that the most beneficial effects on attention and memory are produced by moderately intense physical activity and emotional tasks, with low-intensity tasks occupying an intermediate position and intense exercises producing the least favorable results. The study used a fairly moderate intensity load, and we can conclude that, overall, the tests conducted confirmed the positive impact of physical exercise on concentration, memorization, and information retrieval. Some negative dynamics in the figures may only indicate that the proposed physical exercise is perceived differently by students depending on their physical fitness, mood, and other influencing factors".

A comparative analysis of the results of the experiment we conducted during a single lesson and the data for the entire academic year, where the study was conducted over the course of a year, allows us to conclude that they are completely identical.

In the context of physical education, this may mean adapting curricula and teaching methods depending on the age group of students to most effectively develop their memory and skills. In conclusion, theoretical aspects of memory development provide an important foundation for understanding learning processes and skill development in physical education. Memory, as a multicomponent process, includes the stages of encoding, storing, and retrieving information, which can be optimized using various methods and strategies. By considering age-related characteristics and the influence of emotional state on memory, physical education teachers can develop effective teaching approaches that promote not only students' physical development but also their cognitive functions. Thus, integrating theoretical knowledge about memory into physical education classroom practice can significantly improve the effectiveness of learning and facilitate students' comprehensive development.

In the context of physical education, this may mean adapting curricula and teaching methods depending on the age group of students to most effectively develop their memory and skills. In conclusion, theoretical aspects of memory development provide an important foundation for understanding learning processes and skill development in physical education. Memory, as a multicomponent process, includes the stages of encoding, storing, and retrieving information, which can be optimized using various methods and strategies. By considering age-related characteristics and the influence of emotional state on memory, physical education teachers can develop effective teaching approaches that promote not only students' physical development but also their cognitive functions. Thus, integrating theoretical knowledge about memory into the practice of physical education can significantly improve the effectiveness of learning and contribute to the comprehensive development of students.

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