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CONTENTS

Chernobay L., Vasylieva O., Lenska O., Morozov O., Terentyev V. TO THE ISSUE OF THE MECHANISM OF ADAPTATION DEVELOPMENT TO THE PSYCHOEMOTIONAL STRESS OF TRAINING IN FEMALE MEDICAL STUDENTS OF GENERAL AND SPORTS GROUPS.....	5
Goncharova A. V., Pavlov S. B., Pavlova O. S., Razumovskiy A. N., Kaur A. ADAPTABILITY OF CARDIORESPIRATORY SYSTEM IN NORMOTENSIVE AND HYPOTENSIVE FEMALE STUDENTS WITH DIFFERENT IMPACT OF THE AUTONOMIC NERVOUS SYSTEM SUBDIVISIONS.....	8
Nataliia S. Hloba, Inna M. Isaieva, Irina S. Karmazina, Dmytro I. Marakushin, Oleksandr A. Hloba THE INTERCONNECTION BETWEEN INDIVIDUAL CIRCADIAN RHYTHMS AND EATING BEHAVIOR AS ONE OF MAIN REASONS OF OVERWEIGHT AND OBESITY IN YOUNG PEOPLE.....	12
Maslova N., Maslova Y. RESEARCH OF THE DENTAL STATUS OF MEDICAL UNIVERSITY STUDENTS.....	16
Pandikidis N. I., Stovan A. O. INFLUENCE OF THE ENVIRONMENTAL FACTORS ON THE HUMAN DIABETES.....	18
Alekseienko R. V., Rysovana L. M. THE INFLUENCE OF NATURAL AND SOCIAL FACTORS ON THE VITAL ACTIVITY OF THE ORGANISM IN MODERN CONDITIONS.....	21
Bulynina Oksana, Voytenko Taisiya THE EMPATHIC ABILITY OF KHARKIV NATIONAL MEDICAL UNIVERSITY STUDENTS WITH THE FUNCTIONAL ASYMMETRY OF A DIFFERENT TYPE.....	24
Nadiia V. Hryhorenko, Marina S. Zimina, Stanislav M. Zimin, Maryna N. Kucher PHYSICAL AND CHEMICAL PROPERTIES OF BILE IN DIABETIC PATIENTS.....	28
Dunaeva O. V., Korovina L. D. THE DEPENDENCE OF THE DEGREE OF METEOSENSITIVITY ON THE STATE OF THE CARDIORESPIRATORY SYSTEM AND THE PRESENCE OF PREPATHOLOGICAL CHANGES IN THE BODY IN MEN AND WOMEN.....	32
Dmytro I. Marakushyn, Inna M. Isaieva, Iryna S. Karmazina, Natalia S. Hloba, Elijah Adetunji Oluwasegun, Kateryna M. Makarova FEMALE VS. MALE: DIFFERENCE IN IMMUNE RESPONSE.....	35
Kyrychenko M. P., Marakushin D. I., Shenher S. V., Dunaeva O. V., Bondar O. O. SOME FEATURES OF THE EYE TEST IN PERSONS WHO ARE SYSTEMATICALLY INVOLVED IN SPORTS.....	38
Sokol O. M., Polishchuk T. V., Khorshunova A. M., Kadnai O. S., Volkov I. I. CORRELATES OF AUTONOMOUS NERVOUS AND IMMUNE SYSTEMS AT INTELLECTUAL EXERTION OF MEDICAL STUDENTS IN CONDITIONS OF COMBINED ACTION OF ENVIRONMENTAL STRESSORS.....	40
Hanna M. Zelinskaya, Katerina A. Zelenskaya, Sukhachova I. A., Kovalenko A. A., Yuliya G. Bazyleva FEATURES OF ADAPTATION REACTIONS OF ORGANISM OF STUDENTS, WHICH DEPEND ON THE PRESENCE OF CHRONIC DISEASES IN ANAMNESIS.....	43
Tishchenko A. N., Lisina A. V., Yurkova O. V., Tishchenko M. O. CERTAIN ASPECTS OF ADAPTOLOGICAL INFLUENCES ON THE DEVELOPMENT OF PSYCHOPHYSIOLOGICAL ADDICTION.....	47
Shtrakh Kateryna Vasyliivna, Rak Larisa Ivanivna, Mulenga Natasha, Samuel Arko Addo, Okoronkwo Ugochukwu, Innocentia Awuzie CORRELATION OF STRESS-PROVIDING AND RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEMS AND NT-PROBNP IN ADOLESCENTS WITH RHYTHM DISORDERS.....	49

<i>Маракушин Д. І., Ісаєва І. М., Кармазіна І. С., Глоба Н. С.</i> ВПЛИВ ОКСИЕТИЛЬОВАНИХ НОНІЛФЕНОЛІВ ТА ЇХ ПОХІДНИХ НА СТАН НЕСПЕЦИФІЧНОЇ ІМУННОЇ РЕЗИСТЕНТНОСТІ ЩУРІВ.....	54
<i>Л. М. Дяченко</i> ВІДПОВІДЬ КЛІТИН ЛЕЙКОЦИТАРНОГО РЯДУ НА ВПЛИВ СТРЕС-ФАКТОРІВ ТА МОЖЛИВІСТЬ ЇЇ КОРЕЛЯЦІЇ ПРИРОДНИМИ АНТИОКСИДАНТАМИ.....	60
<i>Vaschuk Mykola A., Sokol Olena M., Khorshunova Anastasiy M., Chernysh Hanna O., Yacenko Alina Yu.</i> ADAPTATION INDEX AND FUNCTIONAL STATE OF CENTRAL NERVOUS SYSTEM IN MEDICAL STUDENTS DURING THE PERIOD OF INTENSIVE LEARNING ACTIVITY.....	67
<i>Ковальов М. М., Чеботенко О. Р.</i> ЯВИЩЕ ЕМПАТІЇ ЯК СПОСІБ АДАПТАЦІЇ ТА ВЗАЄМОДІЇ В СОЦІАЛЬНІЙ СФЕРІ.....	70

THE INFLUENCE OF NATURAL AND SOCIAL FACTORS ON THE VITAL ACTIVITY OF THE ORGANISM IN MODERN CONDITIONS

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ABSTRACT

The problem of regulating the vital activity of the human body is to study the mechanisms underlying its integrity and its relationship with the environment. Adaptive mechanisms provide homeostasis, functional activity of various body structures and their interrelationship with each other. An organism with higher morphofunctional indices of physiological systems and genes has an increased ability to carry out more significant physical loads, volume, intensity and duration. Moreover, the organism adapted to the loads has much greater reserves than the unprepared, and can use them more economically and fully. Self-regulation it is a mechanism for mobilizing and updating the capabilities of a person, compensation and regulation of mental manifestations in connection with the needs and goals of life activity. Regulation of the vital activity of the human body is a whole complex of reactions and mechanisms aimed at controlling all life processes.

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At the beginning of the new millennium, scientists are increasingly concerned about the problem of human health, especially factors that ensure and influence health, as well as indicators characterizing and evaluating health, as a process of effective targeted impact on health, living standards and accumulation of its reserves. Differences in the living conditions of modern man and his ancestors are becoming more pronounced and more noticeable. A person is increasingly not adapting, but rather adapting the world around him to his existence, getting pleasure, while losing the protective mechanisms of adaptation developed by the body in the process of evolution.

The state of scientific development of the problem.

The problem of regulating the vital activity of the human body is to study the mechanisms underlying its integrity and its relationship with the environment. Adaptive mechanisms provide homeostasis, functional activity of various body structures and their interrelationship with each other, working capacity, the longest possible life in a given condition, and reproduction. They arise under the influence of various physical, psychological, social and natural factors. Natural factors of adaptation act on the body in the aggregate or separately. Social, physical and psychological factors of adaptation are directly related to the work activity of a person and the way of life.

Purpose of the article. The purpose of this article is to assess the impact of natural and social factors on the vital activity of the human body and the degree of adaptation of the functional systems of the body to modern living conditions.

Main material. In modern conditions, a person is under the influence of limiting physical and mental stress. The problem of mental load and its regulation for the preservation, maintenance of health and its improvement belongs to the important areas of theoretical, applied, experimental research in the system of sciences dealing with human health. The external environment and its impact on the body, as well as the vital activity of a person, is caused by the intake of substances necessary for the vital activity and development of the human body, as well as irritants (beneficial and harmful) that violate the constancy of the internal environment. The body through the interaction of functional systems in every way seeks to maintain the necessary constancy of its internal environment [1,2].

The principle of integrity and unity of the organism with the external natural and social environment underlies the study of the work of the organs and interfunctional systems of man. An organism is a harmonious unified self-regulating and self-developing biological system, the functional activity of which is caused by the interaction of mental, motor and autonomic reactions to environmental influences, which can be both beneficial and detrimental to health. All its organs (elements of the system) are interconnected and interact. Violation of the activities of one body leads to disruption of the activities of others. A huge number of cells are supplied with nutrients and the necessary amount of oxygen in order to carry out the vital processes of energy formation, elimination of decay products, providing various biochemical reactions of vital activity, etc. These processes occur due to regulatory mechanisms that carry out their activities through the nervous, circulatory, respiratory, endocrine and other systems of the body. Without knowledge about the structure of the human body, about the patterns of functioning of individual organs and body systems, about the peculiarities of the course of complex processes of its vital activity, it is impossible to organize the process of formation of a healthy lifestyle and physical training of the population, including young students [2,3].

The basis of the vital activity of the organism is the process of automatically maintaining vital functions at the required level, any deviation from which leads to immediate mobilization of the mechanisms that restore this level (homeostasis). Homeostasis is a set of reactions that maintain or restore relative to the dynamic constancy of the internal environment and some physiological functions of the human body (blood circulation, metabolism, thermoregulation, etc.). This process is provided by a complex system of coordinated adaptive mechanisms aimed at eliminating or limiting the factors affecting the body, both from the external and from the internal environment. It allows you to maintain the constancy of the composition, physico-chemical and biological properties of the internal environment, which is maintained through self-regulation of metabolism, as well as self-realization of blood circulation, digestion, respiration, excretion and other physiological processes [2,3].

In the process of adapting the organism to any factor, including pathogenic, the function of some systems, organs and cells is enhanced, their metabolism is stimulated and the need for energy increases. On the contrary, the function of other systems, organs and cells that are not participating in adaptation, decreases, their metabolism is weakened and the need for energy decreases. So, when there is a lack of oxygen in the environment (for example, a highland region), blood circulation, external respiration, blood system, i.e. the systems responsible for providing the body with oxygen (gas transmission systems), but at the same time the activity of the excretion, digestion and reproductive systems is reduced. At the same time, during food starvation, the search activity of the organism increases; receiving food activates the digestive system, liver and pancreas, while reducing the function of other organs and systems. The interaction is manifested in a single cell population, and in subcellular structures [3].

The biophysical and physiological mechanisms and patterns of improving the work of individual systems of the body and their elements, under the influence of directed physical training, in modern conditions acquire a new meaning. An important role is played by physical exercises, as well as functional indices of body training at rest, and when performing standard and extremely hard work. The formation and improvement of various morphophysiological functions of the body as a whole depend on their ability to further develop, which is largely genetic (innate) basis and is especially important for achieving both optimal and maximum indicators of physical and mental performance. It should be aware that the ability to perform physical work can increase many times, but to certain limits, whereas mental activity actually has no limitations in its development.

Each organism has certain reserve capabilities. Systematic muscular activity allows, by improving physiological functions, to mobilize those reserves, the existence of which a person may not even realize. Moreover, the organism adapted to the loads has much greater reserves than the unprepared, and can use them more economically and fully. An organism with higher morphofunctional indices of physiological systems and genes has an increased ability to carry out more significant physical loads, volume, intensity and duration. The characteristics of the morphofunctional state of various body systems that are formed as a result of motor activity are called physiological indicators of fitness. The main means of physical culture in the process of physical training is exercise. An important task of the exercise is to maintain health and performance at an optimal level by enhancing recovery processes. During the exercise, higher nervous activity, functions of the central nervous, neuromuscular, cardiovascular, respiratory, excretory and other systems, metabolism and energy, as well as the neurohumoral regulation system of vital body functions are improved [4,5].

Self-regulation can be defined as the mechanism of a person's internal mental activity in the process of adaptation to the conditions of life activity. It is a mechanism for mobilizing and updating the capabilities of a person, compensation and regulation of mental manifestations in connection with the needs and goals of life activity.

The normal functioning of the body is provided by the self-regulation of all manifestations in the field of metabolism, the biogenesis of ultrastructures and the implementation of diverse functions at all levels. Thus, a decrease in the number of erythrocytes in the blood becomes a stimulus for the production of erythropoietin by the kidneys, which activates erythropoiesis and normalizes the number of erythrocytes. At the same time, a decrease in blood glucose levels activates the sympathetic-adrenal system and sympathetic neurohormones, enhancing liver glycogenolysis, which in turn normalizes glucose levels [6,7].

Conclusions. Thus, a thorough study of the mechanisms of self-regulation and self-realization and, of course, observation of them will enhance the process of effective human health management. Applied and experimental studies of the mechanisms of mental self-regulation, taking into account personal characteristics of a person, external conditions of vital activity, significant situations, can be more targeted and selective to assist in the development of a whole system of preventive, hygienic and therapeutic measures to enhance physical and mental health of a person.

Regulation of the vital activity of the human body is a whole complex of reactions and mechanisms aimed at controlling all life processes in accordance with the requirements of the genetic program of the organism and the state of the environment in order to save life and continue the race.

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