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VALEOLOGICAL RELATIONSHIP OF PHYSICAL WORKABILITY  
WITH HEALTH INDICATORS*Heera H.S.<sup>1,2</sup>, Najar S.S.H.<sup>1,3</sup>, Shevchenko A.S.<sup>4,5</sup>, Lytvynenko O.Yu.<sup>4</sup>*<sup>1</sup>Donetsk National Medical University, Kropyvnytskyi, Ukraine<sup>2</sup>Sri Manakula Vinayagar Medical College, Pondicherry, India<sup>3</sup>Al-Azhar University, Gaza, Palestine<sup>4</sup>Kharkiv National Medical University, Kharkiv, Ukraine<sup>5</sup>Kharkiv Regional Institute of Public Health Services, Kharkiv, Ukraine<https://doi.org/10.35339/ic.10.1.hns>**ABSTRACT**

A theoretical study is written in the form of a short report on approaches to qualitative and quantitative assessment of health and physical performance. Physical, mental, social, sexual health, their relationship to physical performance, and measurability to assess and compare individual and population outcomes are discussed. Separate models of health quality assessment and its formation are noted. Philosophical systems of understanding health, psychological approaches to its study, pedagogical systems of formation are described. It was noted that the level of physical health of a person depends on his ability to maintain the balance of homeokinesis parameters. The significance of adaptation and dysadaptation processes is described. It is proposed to draw up a "vegetative passport" of a person with an indication of the vagosympathetic balance. Physical performance, which is often evaluated together with anthropometric data, aerobic and anaerobic endurance, neuromuscular coordination, flexibility, stress resistance, is taken into account when planning sports training and professional tasks with a difficult physical component. In ordinary life, it can be reduced due to the wide distribution of hypertension, coronary disease and smoking, and frequent vascular crises. Cardiorespiratory capacity (reserves) and exercise tolerance can be carefully determined using special functional tests. The relationship between physical capacity and health indicators determined in the study allows to objectively determine tolerance to physical exertion and compare capacity in the population and in different periods of a person's life.

**Keywords:** *models of health diagnosis, adaptation and maladaptation, homeokinesis, tolerance to physical exertion.*

The future of successful medicine largely depends on its preventive (valeological) direction. Relying only on the medical direction is hopeless. Therefore, it is rational to focus the efforts and resources of national health care systems on developing the adaptive potential of practically healthy people [1]. An important step in this direction should be a reassessment of the non-alternative attitude of the medical staff towards everyone who is in their field of vision as "healthy-sick". The quality and quantity of health can be evaluated

from the philosophical position of "rehabilitation dualism", the balance of the work of systems and anti-systems [2; 3, p. 34]. A person's functional reserve determines both his resistance to adverse factors and the ability to adapt. And, according to M. Amosov, this reserve ("amount of health") can be measured [4]: *"The amount of health" can be defined as the sum of the "reserve capacities" of the main functional systems. In turn, these reserve capacities can be determined through the "reserve coefficient"*. Quantitative measurement of quality (qualimetry), based on the method of weighting coefficients expert determination, is used by the World Health Organization to determine the levers of public health regulation [5] and is the basis of many academic disciplines studying it [6]. There are also models that use the definition of "quantity of health", in particular, the model of "pre-nosological diagnosis" by Kaznacheev V.P.

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and Baevsky R.M. (1974), and the model of "diagnosis of health by direct indicators" by Apanasenko H.L. et al. (1985) [7].

The authors of the first model propose to carry out pre-hospital diagnosis based on the indicators of vegetative tone and tension of adaptation mechanisms, as well as to make a functional diagnosis that reflects 4 stages of approaching the disease: 1) satisfactory adaptation (eustress); 2) functional tension of adaptation mechanisms (sub-adaptation); 3) unsatisfactory adaptation; 4) disruption of adaptation mechanisms (dysadaptation). The vectorial nature of the changes in homeokinesis and adaptation mechanisms reflects the rehabilitation diagnosis, which takes into account the genotype and "vegetative passport" of the patient.

The model of "health diagnosis by direct indicators" focuses on the coincidence of biological age with the calendar age, biological function of survival, rehabilitation potential. Health assessment according to this model takes into account self-assessment of health, clinical and physiological indicators (vital lung capacity, body mass index, etc.), which are compared with the average values of these indicators at a certain calendar age for a specific population. According to the obtained result, the patient is assigned to one of the groups: I (from -15 to -9 years, *slowed aging*), II (from -8.9 to -3 years), III (from -2.9 to +2.9 years, *normal aging*), IV (from +3 to +8.9 years) and V (from +9 to +15 years, *accelerated aging*). The model operates with the concepts of "age-related destruction" and "health reserve", and also philosophically connects health with longevity due to the rate of aging.

Another important component of health is well-being, to which the WHO appeals in its definition of health [5]. To some extent, this well-being is characterized by positive emotions and satisfaction with one's life, social adaptability and resistance to psychosocial stress. This actually leads to the need to discuss mental adaptation and maladaptation. Psychological and sociocultural ideas about health are reduced to three models: *antique* (based on internal consistency), *adaptive* (in which the individual is adapted to the natural and social environment), and *anthropocentric* (in which all-round self-realization and the disclosure of the creative potential of the individual are important) [8]. They actually describe adaptation options.

It is also known [9] that mental maladaptation is a prerequisite for neurotic disorders. Mental well-being is closely related to mood balance, the

ability to sleep normally, good physical well-being, energy, adaptation to stress, industriousness and sufficient social activity. Extreme degrees of mental maladjustment are self-destructive behavior, overwhelming tendency to violence and suicidal behavior. Other signs of maladaptation are reduced ability to perform economic, social, biological, emotional and intellectual tasks, deviant behavior. Certain non-pathological disorders of biological, psychological and behavioral adaptation harm the survival and reproduction of the species. Therefore, many health researchers place sexual health alongside mental, somatic, and social health [10, p. 20–30]. And to characterize mental, somatic, and social health, they offer the following list of signs: absence of complaints about well-being, moderate altruism, self-respect, self-sufficiency (autonomy), sense of self-worth, and the ability to love.

In academic psychology, cross-cultural, discursive, norm-centric, phenomenological, holistic, axiological, and integral approaches are used to study health [11]. A cross-cultural approach allows us to identify national influences on perceptions of normal health. The discursive approach examines the logic of constructing ideas about health, different health systems and individual health practices. Within the holistic approach, natural and scientific principles of analysis are complemented by humanitarian ones. The axiological approach consists in treating health as a universal human value. In the practice of valeological education, a competence approach is used [12]. Valeological competence is considered as the ability to lead a healthy lifestyle and practice safe behavior patterns. The key to good health is giving up bad habits, a balanced diet, sufficient physical activity, a rational regime of work and rest, avoiding injuries, environmental, radiological and toxicological risks, cooperation with the medical system (vaccination of infectious diseases, timely treatment of detected diseases, participation in screening examinations, for example, annual fluorography, etc.), psychohygiene (maintaining emotional balance), safe sex.

Within the framework of H.L. Apanasenko's theory (1985) the level of somatic health of a person determines the performance of aerobic metabolism. High productivity increases the body's resistance to various adverse factors (hypoxia, intoxication, blood loss, radiation, etc.). In turn, the high resistance of the body forms normoreactivity and eustress, which are also correlated with high rehabilitation potential and work capacity. Another



important basis of health is the vagosympathetic balance, which is determined by the density of receptors and their sensitivity (eutonia). Within the preventive paradigm of future medicine, it is appropriate to draw up a person's "vegetative passport", which should indicate the predominant reaction to external and internal influences – vagotony or sympathotony [7; 13].

Physical capacity, which is manifested in various forms of muscle activity, characterizes the physical "form" of a person or his ability to do physical work and sports. It is often equated with physical endurance. To assess physical performance, the ability to perform dynamic, static or mixed work is studied. Quantitative determination of physical capacity is necessary for drawing up a sport training plan, determining the volume of tasks for representatives of professions with a heavy physical component (military, rescuers, etc.). At the same time, both indicators of physical strength and endurance, as well as cardiometabolic parameters, are subject to measurement and improvement [14; 15]. Physical capacity is evaluated together with anthropometric data, aerobic and anaerobic endurance, neuromuscular coordination, flexibility, stress resistance. Various types of sports and professional activity require a higher minimum level of these indicators. In ordinary life, the intensity of physical exertion is not high, and such exertion has a pronounced aerobic nature, therefore, everyday work is limited by the oxygen transport system. But the high frequency of vascular crises, the spread of hypertension, coronary disease and smoking force us to pay attention to the cardiorespiratory capabilities (reserves)

of every person in age after 40. The load tolerance threshold is determined by special functional tests [16–20]. The clinical signs of the threshold of tolerance include complaints of difficulty breathing, an attack of angina pectoris, pronounced fatigue, weakness, dizziness, acute pallor or cyanosis, coldness of the extremities, impaired coordination of movements. Threshold loads determine the limit of possibilities, so they should be tested in conditions where medical care can be provided to the patient.

### Conclusions

The indicators of health and physical performance are closely related and measurable. The valeological connection of physical working capacity with health indicators allows objective determining tolerance to physical exertion and comparison of working capacity in the population and in different periods of a person's life.

### DECLARATIONS:

#### Disclosure Statement

The authors have no potential conflicts of interest to disclosure, including specific financial interests, relationships, and/or affiliations relevant to the subject matter or materials included.

#### Data Transparency

The data can be requested from the authors.

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