

PHYSICAL ACTIVITIES AND EXERCISES INCREASING AS EFFECTIVE AND ACCESSIBLE MEANS OF COMBATING DISEASE AND REDUCING MORTALITY OF COVID-19

The rapid development of technology in the modern world, in addition to improving comfort and working and leisure conditions, is also associated with health problems. In general, they are associated with almost complete lack of physical activity and poor nutrition. Comfortable travel to work by car or electric scooter, full-time sitting in front of a computer, fast food and resting in front of a TV or monitor screen is a common picture for most people. And this is what impacts the biggest component of health. Human health depends on many components such as genetics, ecology and medicine level, but it is the lifestyle that includes nutrition and physical activity that is the largest, more than 50% of the components that a person can actually influence. The vast majority of modern diseases that kill millions of people worldwide each year, such as hypertension, heart attack, stroke, diabetes, obesity, osteoporosis and sarcopenia, are the result of their lifestyle. Unfortunately, Ukraine has one of the worst situations where mortality exceeds birth rate, and the lowest life expectancy among European countries.

The situation has been significantly exacerbated by the global coronavirus pandemic COVID-19, which has been going on for the second year in a row and has killed more than three million people. The word of the year was the word "lockdown", people are forced to stay at home and not allowed to go outside without a vital need, which minimized the already low physical activity of people. Most sports sections, centers and stadiums are either closed or severely limited in their ability to provide services to people. And while all nations are taking unprecedented steps to curb and defeat the disease, spending huge amount of money on vaccines and effective treatments, restricting people's freedom of movement, scientists seem to have found an effective way to significantly improve the situation.

Analysis of recent scientific studies has identified people who suffer of coronavirus disease in a more severe way or even die of it. Research shows that overweight people with a BMI of 30 or more, as well as obese people, have a significantly higher risk of hospitalization than people with normal BMI. And severe coronavirus infection and death are especially associated with visceral obesity.

It should be noted that obesity and overweight themselves are an epidemic of the 21st century that has swept the world. Obesity has been shown to cause serious illnesses such as diabetes, cardiovascular disease, cancer, asthma, liver and kidney dysfunction, and infertility. Based on recent scientific studies, scientists consider adipose tissue a full-fledged endocrine organ that produces hormone-like substances such as adipokines, cytokines, growth factors, leptin, resistin and many others. To date, more than 600 different factors have been discovered that are produced and secreted by adipose tissue and affect the metabolism of glucose, lipids, coagulation, appetite, vascular and cardiovascular function, and more. Various biochemical mechanisms have been identified by which obesity causes critical systemic oxidative stress, leading to mitochondrial dysfunction, cellular defenses, and metabolic diseases. Studies show a linear relationship between waist circumference and all-cause mortality. Thus, with an increase in waist circumference of only five centimeters at the same time, the risk of death increases by 17% in men and 13% in women. Thus, it can be manifested that people who are obese or overweight on the background of persistent inflammation is a violation of the immune system which makes them vulnerable to infection that requires a rapid cellular immune response. This is fully consistent with recent studies, the findings of which are disappointing for obese people

because they have a much higher mortality from COVID-19 than among patients with normal body weight.

It turns out that people who are overweight or obese should try to get rid of this problem. At the same time, epidemiological studies indicate that the main cause of the global problem of obesity is change, and in particular a decrease in physical activity and diet. At the same time, the active search for scientists to strengthen the immune system and ways to regulate body weight gives optimistic results. According to scientists, around the world, this way is to increase physical activity and healthy eating, which includes more fruits and vegetables in the diet. Studies convincingly demonstrate a strong link between physical activity and the body's defense system. The immune system was very sensitive to exercise. Physical exercises from moderate to high intensity and lasting up to 60 minutes are now considered an important component of the human immune system.

Like adipose tissue, muscle tissue is now perceived by leading scientists as a separate human endocrine organ that synthesizes and secretes many hormone-like substances that have anti-inflammatory properties. Exercise has been shown to improve the antipathogenic activity of tissue macrophages while enhancing the recirculation of immunoglobulins, anti-inflammatory cytokines, neutrophils and other immune cells, improving immune system activity and metabolic health, and slowing immunological aging. Regular exercise has a general anti-inflammatory effect which is expressed in the reduction of inflammatory biomarkers in adults with higher levels of physical activity. The study of the mechanisms by which exercise strengthens the immune system and reduces the risk, severity and duration of viral infections shows a marked increase in levels of potent anti-inflammatory cytokines such as IL-10, IL-1 receptor antagonist, IL-37 and myokine IL-6, which is a major factor in anti-inflammatory action. Exercises with weights reduce the expression of TLR-4 mRNA on the surface of monocytes, which is an important mechanism of anti-inflammatory action. Medium- and high-intensity aerobic exercise has a positive effect on lung function, helping to reduce the risk of respiratory infections, including COVID-19 and pneumonia.

Serious research at the level of randomized controlled trials with double placebo control and RCD meta-analyzes has proven the therapeutic and positive properties of many different types of exercise. Thus, aerobic or cyclic exercises increase the stroke volume of the heart and the level of maximum oxygen consumption, which greatly affects health by increasing its level. Maintains a high level of activity of the enzyme telomerase, which protects the chromosome thermometers from contraction. Exercise such as running provides a healthy diet for intervertebral discs. Strength training stimulates a denser filling of bone tissue and its loss, protecting a person from osteoporosis, as well as affecting the bone marrow, which ensures the work of the immune system at a high level. Complex coordination exercises found in various types of gymnastics, martial arts and figure skating best protect the human brain from weight loss and the development of diseases such as cyanotic dementia and Alzheimer's disease, as well as used in their treatment. This list can be listed for almost all diseases or parts of the human body that have a proven therapeutic and positive effect of a particular type of exercise. However, very high sports and competitive physical activity of athletes that are associated with constant stress, on the contrary, suppress the immune system and lead to an increase in disease. It should also be emphasized that no single sport is able to develop, maintain and keep human health in the most harmonious way. This task can be solved only by a well-formed system of physical culture and physical education in educational programs.

Numerous current studies have identified a strategy to reduce the risk of mortality, especially with overweight and obesity during the COVID-19 pandemic. This strategy is effective and accessible to everyone, even during quarantine and self-isolation. It includes mandatory weight control with a transition to a healthy diet and increased physical activity with both aerobic and strength exercises.

Summarizing the above scientific data, I believe that the last line and responsibility falls on the education system and the management of higher education institutions that are obliged to conduct educational work both in practice and in the form of teaching theoretical knowledge to correct the critical situation around the world and in our country.

The tendency to reduce funding and close the departments of physical education in universities on this background looks unreasonable and short-sighted policy that will only worsen the already bad situation with the health of the population of Ukraine and life expectancy, which is a very serious threat to our country.