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THE PREVAILING RISK FACTORS OF CARDIOVASCULAR DISEASES IN MEN OF MATURE AGE AND THEIR CORRECTION BY MEANS OF HEALTH RELATED FITNESS

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Statement of the problem. In modern conditions the health of the nation to a great extend depends on the development of the industry of recovery. Moreover, if at the end of the twentieth century, emphasis was made on pharmacological means of healing, today science and practice in many countries is focused on disease prevention with the use of non-medical means, among which the leading role is played by tools of health related fitness [8]. The increased interest of specialists to the organization of health related motor activity is caused by the necessity of introducing of effective mechanisms for the prevention of chronic non-communicable diseases which have become a major cause of premature death [10]. Of particular concern is the increase in premature mortality among the working-age population. 40% of all deaths from cardiovascular diseases (CVD) are persons from 25 to 64 years [15]. According to experts, the main reason for the significant growth of these indicators remains cardiovascular diseases. According to WHO, cardiovascular diseases are the leading cause of death around the world: for no other reason, each year will not die as many people as from CVD [13]. More than 75% of deaths from CVD occur in countries with low and middle income, which include Ukraine. Most cardiovascular diseases can be prevented by taking measures aimed at elimination of risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and alcohol abuse, with strategies aimed at the population as a whole. According to the latest recommendations of the WHO expert Committee, there is a need to start preventive interventions in cases when blood pressure at least once reaches 160/95 mm Hg. art. and above, the body mass index of Quetelet equals to 29.0 and more; with regular smoking even one cigarette per day; low physical activity (more than half working time a person spends sitting, and in his spare time walking, lifting, etc. are less than 10 hours per week) [10].

The results of the study show that men of mature age often at the same time have two, three or more risk factors, most of which are interrelated. Therefore, even if the level of each will be increased moderately, CVD risk may be high due to the combined cumulative impact of factors. Therefore, in the assessment of CVD risk one should take into account all existing risk factors and their contribution to the formation of the total score.

Analysis of recent researches and publications. The analysis of literature data showed that in the global and domestic literature has been accumulated considerable material on the effects of risk factors on the cardiovascular system and the use of means of physical culture to improve health [1-8, 12, 14]. Positive changes can be expected only when activating the system of disease prevention and health improvement. Experts in the field of fitness and recreation found that regular exercises with an adequate load increase the functional and adaptive reserves of the major systems of the body middle-aged people [4] and reduce risk. The WHO indicates that the prevention of chronic non-communicable diseases is 2.7 times less costly than the treatment of patients [2, 13]. While a healthy lifestyle of the population is five times more effective than diagnostic and

treatment activities in all branches of medicine.

The special literature discusses the evaluation and regulation of motor activity of persons of mature age, the risks of "sedentary lifestyle" [4-6, 11]. Based on the received data, scientists determined the role of motor activity in the lifestyle of a modern man, which low level is regarded in the number of many factors which lead to reduced efficiency and accelerate the development of involution changes that promote the growth of various diseases, primarily, cardiovascular ones.

In the result of studies conducted at different times with different categories of people, it was found that the majority of mature workers have an insufficient level of physical activity, their preferences are mainly associated with comfort, sedentary pastime [2, 11].

In the last decade, indicators that reflect the incidence of diseases of the cardiovascular system, the prevalence of risk factors for diseases of the circulatory system, became available for a wide range of people who are interested in this issue. In recent years, the mortality rate from diseases of the circulatory system in the post-Soviet States were much higher than in Europe and the United States, but in the world, including Europe, there are significant differences in the prevalence and mortality of cardiovascular diseases [13, 15].

People suffering from CVD or at high risk of such diseases (in connection with one or more risk factors such as high blood pressure, diabetes, hyperlipidemia, or already developed disease) require early detection and assistance through reduction of risk factors for cardiovascular diseases. The WHO office in Ukraine and the Swiss cooperation office introduced a joint four-year project "non-communicable diseases: prevention and health promotion in Ukraine". Every year 86% of Ukrainians die from non-communicable diseases. First of all, these are cardiovascular diseases and cancer, diabetes and chronic respiratory diseases. These diseases are united by so-called behavioral risk factors: cigarettes, alcohol, junk food, neglecting of physical exercise [7].

The researches were carried out according to the scientific themes of the Department of health, fitness and recreation National University of physical education and sport of Ukraine "Theoretical and methodological bases of health and recreational physical activity in different population groups" (state registration number 0116U001630).

The purpose of the research - to determine the prevalent risk factors of cardiovascular diseases in men of mature age and to identify possibilities of their correction by means of health related fitness.

Methods and organization of the research: analysis of special scientific-methodical literature and documentary materials, the comparative method, sociological, pedagogical methods of research, statistical analysis of data. The study involved 60 men of the second period of mature age (40-50 years).

The results of the research and their discussion. We carried out a study aimed at assessing risk factors of cardiovascular diseases in men of the second period of mature age. In the result of the studies it was found that in 18.3 % of men the risk is missing, in 65 % – there is a minimal risk, in 20 % of the examined persons the risk is explicit and in 6.7 % - is high. The maximum risk of developing cardiovascular diseases in the contingent has not been identified. There is a fact that among men of the second period of mature age with minimal risk of developing cardiovascular diseases, dominated by persons in the medical history of which prevails several risk factors with a slight excess of standard indicators. The total number of them significantly increases the risk of developing diseases due to combined impact. In most persons in the group the total score is at the upper value (closer to 20 points), and even a slight increase in any of the indicators can transfer them in a group with an explicit risk of developing cardiovascular diseases, which requires increased attention to the contingent.

It is established that in the majority of the

studied men of the second period of mature age are often simultaneously detected two, three and more risk factors, most of which are interrelated. Therefore, despite the fact that the level of each is increased moderately, the risk of CVD is quite high, due to the combined influence of factors on each other. In most cases, the risk of CVD in most men of the second period of mature age is caused by factors such as neuro-emotional overloads, bad habits (smoking and poor nutrition), hypertension, overweight and low physical activity. All of the above factors, prevailing in the structure of CVD risk, are controlled, that is, those that can be influenced. Controlled cardiovascular risk factors are mostly related to the lifestyle of men of the second period of mature age that it is important to consider when designing programs for health related fitness.

Controlled risk factors account for an average of 15-17 points. It should be noted that it is possible to significantly reduce the risk of development of cardiovascular diseases, according to WHO recommendations, when you stop smoking, change eating behaviour and increase physical activity. These risk factors are predominant and in the investigated group of reasons, along with stressful way of life, they make a significant contribution to the formation of the total increased risk of developing CVD. So more than half of the studied contingent smokes more than 10 cigarettes a day, has a body mass index more than 28 kg*m-2, the motor activity is less than 3 hours a week. In 71,6 % of men of the second period of mature age lifestyle is stressful, 18,3 % – partly and only in 10% - stress is absent or insignificant.

The study has found that among men of the second period of mature age, 61,6% smoke. Among them, more than half (58,3%) smoke 11-20 cigarettes per day, or 16,7% more than 20 cigarettes a day and 25% less than 10. Excessive and unrestricted diet is registered in 17,1 % of men, a few excessive in 71,3%, very moderate -in 11,6%. Imbalance and redundancy of diet is evidenced by a body mass index of the studied contingent and it is on average 28,25±2,52 for men aged 46-50 years and 25,54±3,79 in men aged 40-45 years (with its maximum values 33,70). Low physical activity is characteristic of most men of the second period of mature age.

Since most of the respondents are engaged in mental or light physical labor, consequently, the amount of specially organized motor activity should be at least 5-8 hours a week. However, survey data indicate that 11,6 percent – spend less than 1 hour; 23,3% of the respondents spend 1-3 hours per week, 28,3 % spend 4-6 hours, 30% - 7-10 hours, and more than 10 hours – 6,8% of men of the second period of mature age (Figure 1).

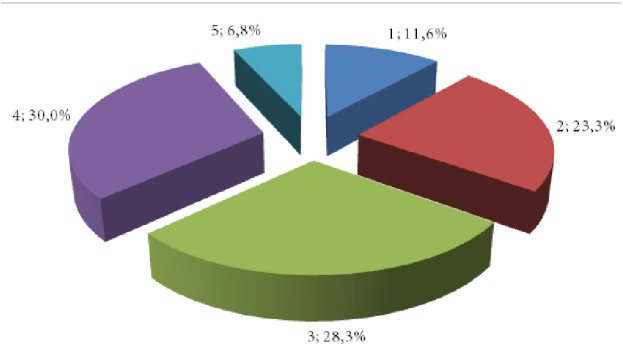

Fig. 1. The number of hours to specially organized motor activity during the week of examined contingent

1 – spend less than 1 hour; 2 – 1-3 hours per week; 3 – 4 to 6 hours; 4 – 7-10 hours; 5 – more than 10 hours.

In addition to the total amount of physical activity, the focus of physical exercises is also important. Since this technique does not involve such selective division, we further specify the focus of activities. The majority of respondents talked about using exercises of mixed aerobic-anaerobic orientation that according to the latest researches of the authors [4] is preferable, since using their metered use these classes induce more favorable changes in coronary blood flow and delivery of oxygen to the myocardium. Considering that with age and in pathological conditions connected with diseases of the cardiovascular

system, there is a natural reduction of anaerobic performance, and then these facts can be attributed in favor of point of view regarding the importance of stimulation of anaerobic metabolism in the contingent.

Uncontrolled risk factors for cardiovascular disease of studied men of the second period of mature age, account for an average of 6-8 points that has already have a significant affect on the total measure of risk. It can be said, that besides such a fundamental factor as a congenital predisposition, it is possible to distinguish not less significant premises, the consequence of which is often pathological conditions of the heart and blood vessels, which can conditionally be attributed to uncontrolled ones:

– constitutional features that can also be attributed to the hereditary factor, because it is known that the asthenic type or the predisposition to obesity are also often genetically programmed, therefore the excess weight is in the group of the main risk factors;

– the basic structure of personal characteristics (character, type of nervous system) such as emotional, vulnerable people are more susceptible to hypertension, vascular dystonia;

– critical age. The most "hazardous" is considered the transition period (menopause in men on average occurs after the age of 50years) connected with endocrine changes in the body (the extinction of many functions, a hormone imbalance). Registered factors are also important when designing programs for health related fitness.

Absence of cases of myocardial infarction in blood relatives (father, mother, brothers and sisters) is observed in 55,1% of men, in one blood relative after the age of 60 years – 31,7%, up to 60 years – 6,6%, the two blood relatives – 5%, three or more such relatives – 1,6%. Hereditary predisposing risk factors of cardiovascular diseases, as evidenced by the data presented in the special literature, do not always lead to disease, as predisposition is transmitted but not the disease itself, but the importance of their consideration is not in doubt.

The results of studies [4] indicate that not only the young but also among older people (40 – 60 years) in 8 – week terms of regular classes the training effect was formed. In a study in the state of muscular rest, there is a decrease in chronotropic function of the heart, improving its contractility, pumping function of the myocardium (increased stroke volume), reduce of total peripheral resistance. Similar data were obtained by Russian authors [5, 6, 8], which suggest that for persons of mature age (second period) with high level of habitual physical activity (more 15720,0±273,0 steps per day) it is typical the efficiency of functioning of the cardiovascular system, higher recovery capacity of the organism after standard physical load, the highest levels of VC and wrist strength, the smallest index of tension of regulatory systems, the balanced state of the autonomic nervous system – amphotonic and the lowest level of hostility and guilt.

The systematic physical exercises in persons of mature age also changes the morphological and functional characteristics of the respiratory system: there is an improvement of the effect of alveolar ventilation by increased oxygenation of the blood. Analysis of the morbidity rate of persons engaged in health related forms of physical culture, showed that the frequency of respiratory diseases is considerably lower than in those not involved, there is a decrease in the frequency of exacerbation of chronic diseases. The presented provisions indicate the need to develop preventive measures, including the construction of health related activity programs, taking into account the peculiarities of this age period.

Our research found that the priority physical activity for persons of second period of mature age are strength training (58,3%); sports games (football, volleyball, table tennis, billiards, bowling) – 41,6%; recreational swimming 38,3%; jogging, walking (36,6%); cycling (25%). Comparatively with the previous researches there is an increase of the percentage of people of mature age

who choose an outdoor physical activity. This is consistent with global trends in the types of physical activity. So, the statistics data given in the reports of the American Association of leisure and entertainment show those persons of mature age mainly choose outdoor physical activity.

Thus, the analysis of the prevailing risk factors for the development of cardiovascular diseases, as well as preferences of men of the second period of mature age in the selection of focus of motor activity, has allowed to define priority types of motor activity and the main motives for the occupation, which formed the basis for the development of the program of training with use of means "Outdoor activity".

Analysis of existing programs of physical activity of men of the second period of mature age, testifies to the considerable attention of researchers to this problem. We confirm among men of the second period of mature age the high demand of the physical activity of strength orientation, as well as significant interest in health related and recreational types of physical activity. The authors [2, 4–6, 8, 10] offer a wide range of means of motor activity for the correction of physical state of persons of mature age. However, in this contradiction here are presented opinions, the issues of determining the optimal levels of stress in the classes taking into account the existing risk factors of CVD in persons engaged in the activities.

The conducted research allowed forming a general idea about the level of health, amount and nature of physical activity, which largely determines the activity of the cardiovascular and respiratory systems of the examined persons. The identified provisions on motor activity have predictive focus, because they were used in the development of not only specific issues of building programs of recreational activities, but also in determining recommendations for lifestyle changes of surveyed in terms of increasing the amount of physical activity as preventive medicine.

According to the research results of domestic and foreign authors [4,5,10], until recently, was the decisive point of view about the necessity of mainly use of cyclic exercises for the prevention of cardiovascular disease and correction of physical state of persons of mature age, due to the fact that such exercises have the greatest impact on the endurance of the cardiovascular system. This determines their use in health programs of jogging, walking, cycling. However, as evidenced by the results of the WHO studies, it is possible to have a high aerobic capacity and get myocardial infarction when performing unusual exercises of speed and speed-strength orientation. Therefore, as shown by the results of the research exercise of mixed aerobic-anaerobic focus when their dosed use induce more favourable changes in the cardiovascular system are preferred [4, 14]. These provisions were used by us in justification of the program of training with use of means of "Outdoor activity". We confirmed the data of foreign authors [14] about means of "Outdoor activity" for persons of mature age.

When developing training programs with the use of means of "Outdoor activity" we considered organizational and methodological conditions necessary for its implementation, which included: the adequacy of the content of experimental program of physical fitness training to requirements of professional activities of men of the second period of mature age, their physical activity; selection of the priority directions of the content of sports and recreational activities; diagnostics, monitoring of indicators of physical condition; individualization of fitness classes with considering physical health and physical fitness; consideration of regularities of formation of adaptation effects to different orientation of physical loads, the use of adequate forms and methods of medical-pedagogical control.

According to Ivashchenko L.Y. [4] the methodology of the regulation of physical loads in sports and recreation activities for persons of mature age involves the study of the nature and extent of severity of the prevailing risk factors, determining peculiarities of adaptation to physical

loads. Therefore, we determined the major controllable risk factors for cardiovascular diseases and especially indicators of physical condition of persons engaged, which formed the basis for the development of the program.

Teaching methods for persons of the second period of mature age should provide solutions to general and specific tasks. To common tasks we referred the use of means of health related fitness for the correction of the physical state of the examined contingent. To the special ones – the increase of physical activity and overall work efficiency.

The importance of resolving common problems is caused by the fact that the increase of the severity of the risk of developing cardiovascular disease leads to significant decrease in parameters of physical performance, and limitation of physical activity, in its turn, increases the risk of diseases.

While we have strived to the maximum extent to take into account the statement of the importance of raising the daily amount of physical activity due to a variety of forms of activities, with considering the physical interests of the students. The goal to enhance exercise performance requires the use of activities of certain parameters to eliminate the limiting links of adaptation. It is known that patients with arterial hypertension improvement of adaptation can be achieved by impact on the mechanisms of regulation of vascular tone. Herewith, it is advisable to use the means of psychophysical regulation, exercises of aerobic orientation that one performs for a long time because they improve the contractile function of the heart, increase the reserves of the cardiovascular system.

Particularly important for the development of health related programs is an issue of the intensity of the maximum permissible volume of loads. In this case, as shown by studies [4], in individuals with the values of the IPC up to 30 ml/min×kg-1 double lessons per week cause the largest increase in health indicators in these relations of intensity and volume loads: 10-12-minute loads – 100% intensity of HRmax; 30-minute loads – the intensity of 80-90% of HRmax; a 40-minute workload – intensity – 75-83% of HRmax; 50-minute loads – the intensity of 70-75% of HRmax; 60-minute loads – the intensity of 55-70% of HRmax. However, our observations indicate significant restrictions in the use of the above recommendations, particularly loads with a pulse mode above 80% of HRmax because in most people with a high risk of developing cardiovascular disease signs of inadequacy arose in the context of such loads.

It is established that optimal effect is achieved with the alternation of the exercise of strength orientation with exercises of aerobic orientation. Inclusion in health related fitness for this contingent of elements of muscle relaxation (relaxation exercises, breathing, autogenic training) has a sedative effect and are accompanied by a reduction in energy consumption, minute volume, blood circulation and blood pressure.

Conclusions. Consideration of risk of developing cardiovascular disease has allowed to identify the most significant risk factors, which include neuro-emotional overload, bad habits (smoking and poor nutrition), hypertension, overweight and low physical activity. It is determined that major risk factors of cardiovascular diseases belong to the controlled group and can be adjusted in the process of preparing lessons of health-improving orientation.

Our research has shown a low level of physical activity of the studied contingent, which confirms the presented in the literature trends to reduce the amount of physical activity of persons of mature age. It is revealed the sedentary nature of work, which along with insufficient physical activity must be considered when designing programs for health related fitness for this contingent.

The proposed training program included several stages: diagnostic, preparatory, basic, and resulting. The basic means used in the program, was the Nordic walking, trainings of strength orientation, stretching. Individualization of physical activity was based on the calculation of the training heart rate during aerobic exercises of specific

duration based on the level of physical condition, the number of sets, repetitions and rest intervals between them when performing strength exercises. At each stage of the program were used adequate means of medical-pedagogical control.

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