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Physical activity and attitude towards disease prevention among men engaged in mobile labor in the Arctic zone of Russia

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The aim of the study was to determine the associations of some parameters of physical activity and disease prevention among men engaged in mobile work in the Arctic zone of Russia depending on the length of expeditionary shift work.

Methods. The object of the study was a "random" representative sample of male workers engaged in expeditionary shift work at the industrial enterprise EURACORE in the Arctic latitudes of the Tyumen region. The sample consisted of 750 men aged 25–54, and the response rate was 82.4%. The length of work in the Arctic was assessed according to three parameters: 1) 3 years or less; 2) 4–9 years; 3) 10 years or more. Attitudes towards physical activity, health and disease prevention were assessed using the standard WHO MONICA-MOPSY questionnaire.

Results. Regardless of the years of expedition shift work in the Arctic zone of Russia, the lowest level of responsibility for their health was observed in the groups with low physical activity. Low awareness of the risks of non-communicable diseases was observed in the groups with low

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physical activity at the minimum duration of expeditionary shift work experience, and the most positive attitude to disease prevention was observed in the groups with the maximum duration of expeditionary shift work experience and the absence of low physical activity.

Conclusion. Thus, the results of determining the associations of low physical activity and the parameters of attitudes to disease prevention in the organized population of oil and gas extraction workers, depending on the length of work in the expeditionary shift method, should be used as an important part of a comprehensive preventive program at industrial enterprises in the Arctic region.

Keywords: organized population, mobile work, physical activity, attitude towards disease prevention, Arctic.

Conflict of interests: none declared.

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Introduction

The health of men working in the Arctic on a rotating basis is determined by many factors: the natural conditions of this region (the severity of the climate includes not only extreme temperatures, but also the aerodynamic regime, electromagnetic factors, photoperiodicity, etc.); constant rhythmic adaptation - readaptation, which has a destructive effect on adaptive mechanisms; stress-generating factors of air flights, long stays outside the usual living conditions in specific rotating teams [1–3]. In addition to the a priori difficult natural and climatic conditions in which oil and gas workers have to work, the expeditionary shift form of work is characterized by a mobile mode and remoteness of workplaces from the base enterprises, constant moving of workers through significant distances [4–6]. Mobile work is associated with an increase in the intensity of work during the shift, longer working shifts, reduced rest periods between shifts with no days off and minimal social and welfare provision, and consequently a pronounced impact of chronic social stressors and reduced adherence to a healthy lifestyle [7–9].

The analysis of data from epidemiological studies and clinical trials has shown that physical activity is the most important factor in the treatment and secondary prevention of coronary heart disease (CHD), and at the same time it has been proven that sedentary lifestyle is one of the independent risk factors (RF) for the occurrence of CHD [10–11]. Since the second half of the 20th century, due to the automation and mechanization of major industries, low physical activity has become a major feature of modern human life, contributing to the high prevalence of RF associated with cardiovascular diseases (CVD) and other conditions [12–14]. In the present era, this is largely true for mobile workers in the Arctic, where the new production technologies have virtually eliminated heavy physical labor [9]. At the same time, due to the impact of many additional production, social, environmental, climatic RF on shift workers, the behavioral characteristics, and especially low physical activity associated with subjective-objective health indicator (attitude to their health and disease prevention), in the extreme conditions of the Arctic region is of particular importance [9].

At the same time, there are not enough scientific publications devoted to the study of the attitude to CVD prevention among persons engaged in mobile labor in the oil and gas production complex of the Arctic zone of Russia [5, 8]. It is extremely necessary to study the real situation with a regard to the profile of conventional and unconventional cardiovascular risk factors in ecologically unfavorable regions of Russia, since these territories employ a large contingent of labor resources, carrying a significant share of the country's economic potential [7–9].

The aim of the study was to determine the associations of some parameters of physical activity and disease prevention among men engaged in mobile labor in the Arctic zone of Russia depending on the duration of work on expedition watch.

Methods

The subject of the study was a "random" representative sample of male workers, aged 25–54 years, engaged in expeditionary shift work at the industrial enterprise EURACORE in the Arctic latitudes of the

Tyumen Oblast. The one-stage cross-sectional study was conducted within the framework of the budget themes № NIOCTR: 122020300112-4 and NIITPM № FWNR-2024-0002. The representative sample was formed from the lists of male workers engaged in expeditionary and shift work at the industrial enterprise EURACORE, which has an extensive network of oil pipeline construction in the Arctic zone of Western Siberia. For the sample formation the generally accepted method of "random numbers" was used, implemented in the computer version, the sample included 750 men at the age of 25-54 years, the response rate was 82,4%.

Inclusion criteria: 1) persons working as expeditionary shift workers at the EURACORE industrial enterprise; 2) persons working at the EURACORE industrial enterprise facilities in the Arctic zone; 3) male gender; 4) age at the time of sample formation in the range of 25 to 54 years; 5) voluntary signing of the informed consent to participate in the study.

Exclusion criteria: 1) stationary workers at the EURACORE industrial enterprise; 2) persons working at the EURACORE industrial enterprise facilities outside the Arctic zone; 3) female gender; 4) age at the time of sample formation outside the range of 25–54 years; 5) refusal to sign the informed consent to participate in the study.

The length of work in the Arctic was assessed according to three parameters: 1) 3 years or less; 2) 4-9 years; 3) 10 years or more.

The standard WHO MONOICA-MOPSY questionnaire [19] was given to each of the subjects included in the representative sample for self-completion. Attitudes towards physical activity, their health and disease prevention were determined by analyzing the statements from the list of fixed answers of the WHO MONOICA-MOPSY standard questionnaire "Knowledge and attitudes towards health".

Statistical analysis

Statistical processing of the study results was performed using IBM STATISTICA 21.0 software. The results were presented as proportions (percentages) - for categorical data. Pearson's chi-squared test (x2) was used to assess the reliability of differences between the sample proportions of the population in the two groups. In all statistical analysis procedures, the achieved level of significance (p) was calculated, and the critical level of significance in the study was considered to be 0.05.

Results

Given the previously established low physical activity in more than a quarter of shift workers and less than a half of shift workers having positive attitude to disease prevention, we considered the specifics of associations of the obtained indicators depending on the length of work in the Arctic [6, 8].

The figures present data on the associations of the parameters of the attitude to disease prevention with the presence or absence of low physical activity among persons engaged in mobile labor in the Arctic zone of the Russian Federation (Fig. 1-3).

If the duration of expeditionary shift work was 3 years or less, those with low physical activity were significantly more likely than those without it to consider the possibility of contracting a serious disease in the next 5-10 years as unlikely (27.3% vs. 8.7%, p=0.0210). At the same time, statistically significant differences were found in the absence of low physical activity, with the proportion of "possible" answers increasing with 10 or more years of experience (85.4% vs. 66.2%, p=0.0176) (Fig. 1).

Regarding the possibility of avoiding some serious diseases by taking preventive measures, the most certain positive answer in the absence of low physical activity (LPhA) significantly prevailed in the group with the maximum number of years of expedition work experience (68.3% vs. 47.6%, p=0.0191). The more uncertain response option "maybe yes" in case of LPhA showed a statistically significant decrease compared to respondents with LPhA with experience of 10 or more years (26.8% vs. 48.3%, p=0.0145) (Fig. 2).

As the duration of expeditionary work increased, the number of those with LPhA who definitely recognized the benefit of health screening decreased significantly: 4-9 years (30.7% vs. 59.6%, p=0.0001) and 10 years and more (58.6% vs. 82.9%, p=0.0042). The most positive response to the question of the possible benefit of a preventive health check was found in LPhA individuals with 10 years or more of expeditionary shift work experience (46.3% vs. 17.3%, p=0.0393) (Fig. 3).

Discussion

The problem of population participation in the preventive programs aimed at changing behavioral habits is

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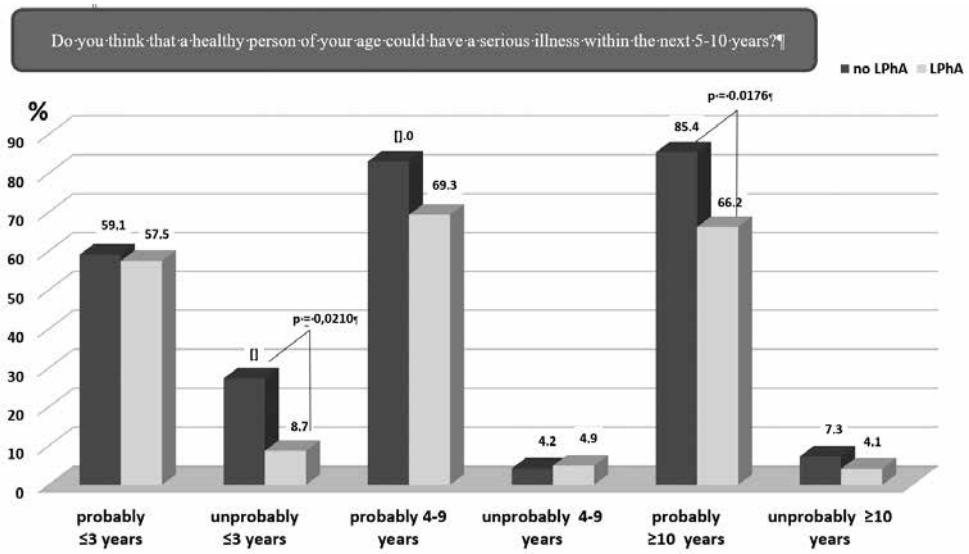

Fig. 1. Awareness of the risks of non-communicable diseases among working on expeditionary shift in the Arctic depending on the presence of low physical activity, %

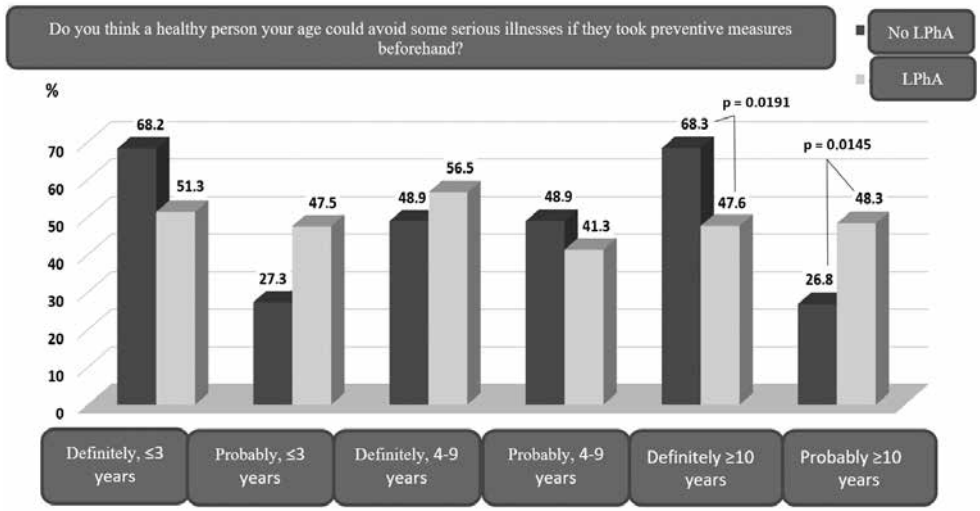

Fig. 2. Attitude to health among those working on expeditionary shift in the Arctic depending on the presence of low physical activity, %

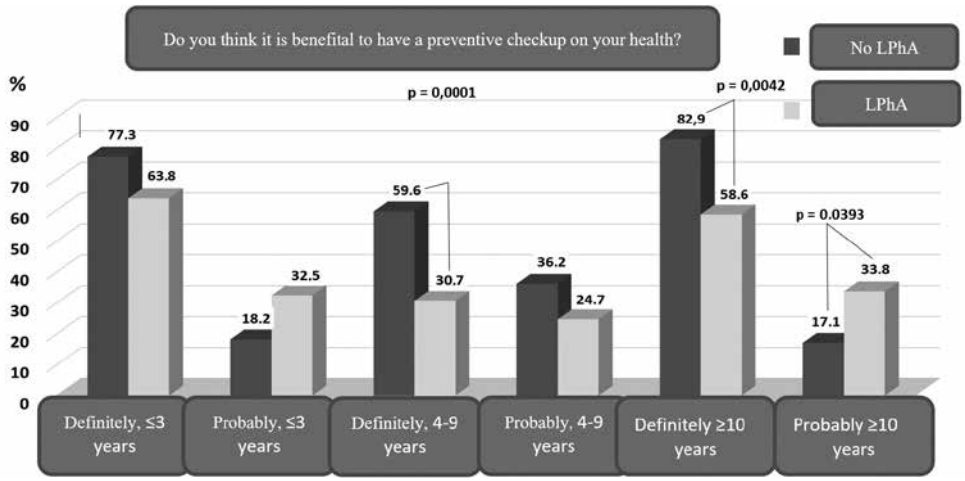

Fig. 3. Attitude towards disease prevention among those working on expedition shift in the Arctic depending on the presence of low physical activity, %

still relevant, since the lack of basic health culture, together with stress, unfavorable environmental conditions, multiply the risks of morbidity and mortality from chronic non-communicable diseases. According to experts, these deaths are premature and can be prevented through prophylactic measures [15]. However, for the success of the preventive programs, the efforts of medical workers alone are not enough, it is necessary to have a conscious desire of the patients themself to change behavioral stereotypes. A kind of indicator of such aspirations is the attitude to one's own health and disease prevention, which is considered to be one of the main socio-psychological factors influencing the activity of the population in ensuring its health improvement [11].

The present study revealed regularities reflecting the relationship between behavioral characteristics and attitudes to their health depending on the length of service as an expeditionary rotational worker in the extreme conditions of the Arctic. The obtained data seem to be confirmed by the results of our previous works on the subjective-objective health indicator among the population of Tyumen, as well as on factors of chronic social stress, whose interrelation with behavioral factors is proved [8]. The paterns found in our previous studies among Tyumen men of working age regarding the decrease in physical activity in groups of low social status were also comparable with the results of the present study [13]. Perhaps this is also due to the new conditions in oil and gas production enterprises, where manual labor is largely replaced by modern computer technologies. The insufficient volume of living space also has an impact. The everyday life of shift workers is not characterized by diversity, the gyms of shift settlements cannot accommodate all comers [9].

In our opinion, the population regularities revealed by the relationships between the subjective-objective health indicator and physical activity in shift workers with minimal work experience are reasonable. This may be due to the fact that in the initial stage of adaptation to the extreme conditions of the Arctic, social and domestic problems are likely to be prioritized, while concern for one's health is more likely to be inherent in persons who have been exposed to it before, i.e. who have purposefully engaged in increasing their physical activity.

Thus, the results of determining the associations of LPhA and the parameters of attitudes toward disease prevention in the organized population of oil and gas extraction workers, depending on the length of service in the expeditions, should be used as an important part of a comprehensive preventive program in industrial enterprises of the Arctic region.

Conclusion

The analysis of the presented study revealed an unfavorable situation in the prevalence of low physical activity and work capacity depending on the length of service in the Arctic region, associated with some parameters of attitude to prevention among workers engaged in expeditionary shift work at industrial enterprises of the oil and gas production complex.

Irrespective of the work duration in the Arctic zone of Russia, the lowest responsibility for their health occurred in the presence of low physical activity. Low awareness of the risks of non-communicable diseases prevailed in the groups with low physical activity at the minimum duration of work on expeditionary shifts, while the most positive attitude to disease prevention prevailed at the maximum duration of work on expeditionary shifts and in the absence of low physical activity.

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