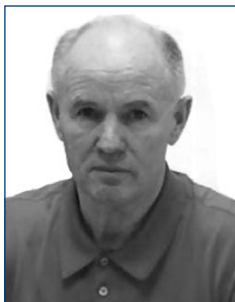


Model of organization of physical and health activity of employees of remote industrial facilities by means of information technologies

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Abstract

Objective of the study was to develop a model for organizing physical culture and health-improving activities of workers at remote industrial facilities based on information technology and evaluate its effectiveness.

Methods and structure of the study. Scientific work was carried out on the basis of enterprises of the oil and gas complex located in the northern regions of the Siberian Federal District. In total, 500 people working on a rotational basis were examined - men aged 25 to 50 years. Questionnaire and testing methods were used (calculation of biological age, Ruffier's test, Stange's test, Harvard step test).

Results and conclusions. The developed model includes three blocks - diagnostic, organizational and activity and control. For each block, the main content is formulated, the implementation technologies and the results that will be obtained in this block are determined. The result is a personalized training program. In the course of its implementation, an automated control over the state of students is carried out according to the criteria presented in the control block of the model.

Keywords: recreational physical culture, rotational work, mobile applications.

Introduction. Shift workers in the conditions of the northern regions experience an excessive load, which is aimed at restructuring and adapting body systems to function in new conditions [1].

One of the ways to prevent health disorders in this case is the involvement of the working population in organized sports and recreational activities [3, 6]. Recognition of the importance of this problem is reflected in the Decree "On the national goals and strategic objectives of the development of the Russian Federation for the period until 2024", which sets the task of increasing the number of Russians systematically involved in physical culture and sports to 55%. Effective measures to implement the Decree are the national project "Sport is the norm of life." One of the main directions of the project "Sport is the norm of life" is the implementation of an information and communication campaign based on the use of modern automated technical means covering 70% of the population to organize their sports and recreational activities

[5]. The target audience for which state policy measures are aimed is also citizens of the middle and older age groups (working-age population), whose indicators of involvement in systematic physical exercises for a number of reasons are lower than those of the younger generation [2].

The reasons for the low involvement of employees in organized physical culture and health-improving activities lie in the lack of conditions for its implementation at most enterprises, the inadequacy of its provision with modern methodological developments, the lack of a systematic approach and effective models of its organization, and the underestimation of the capabilities of modern technical means [4].

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Results of the study and their discussion. The developed model is shown in Picture 1 and includes three blocks - diagnostic, organizational and activity and control. For each block, the main content is formulated, the implementation technologies and the results that will be obtained in this block are determined.

Scheme of the model of organization of physical culture and health-improving activities of employees of remote industrial facilities based on information technologies

The main content of the *diagnostic block* is an assessment of the level of health of employees of the enterprise, their physical activity in shift and inter-shift periods, as well as a description of the nature of work - physical activity, its nature and intensity, temperature conditions, forced postures and the presence of harmful factors. To solve the tasks, a questionnaire is used through the Google platform, as well as a number of functional tests performed using mobile applications - the calculation of biological age, the Ruffier test, the Stange test, the Harvard step test. Based on the results of this block, a database was formed on individual health, physical activity and the nature of the work of employees, the needs for motor recreation were assessed, and a plan of physical culture and recreational activities was determined.

The main content of the *organizational and activity block* was the organization of physical culture and recreational activities of employees of remote industrial facilities using information technology. The structure of physical culture and health-improving work included target, active and control-evaluation stages. A complex of exercises of various intensity and orientation was compiled, aimed at people with different levels of health, physical activity and different nature of work. Algorithms for individual selection of exercises and the formation of physical culture and health programs were also developed, taking into account the results of the diagnostic block, as well as algorithms for current control in the process of implementing programs and correcting the intensity of the load. These algorithms were implemented as mobile applications for Android and IOS.

The *control block* was aimed at evaluating the effectiveness of the model implementation. It included both a questionnaire survey and objective monitoring of physical activity and the level of health of workers. For its implementation, a web portal was developed, which made it possible to provide information support to employees in planning, organizing, monitoring and managing the training process. The portal includes the main sections: "Health and Healthy Lifestyle", "Exercise System", "Control and Self-Control", "Questionnaires", "Forum and Chat". The web portal allows you to organize the constant interaction of project participants with consultant-trainers and doctors, provides automatic processing of incoming information, issuance of recommendations to participants and analytical reports to project managers and enterprises.

Content	Implementation	Results
Diagnostic block		
Health status	A set of simple tests performed using a smartphone, entering the results into a Google spreadsheet Questionnaire survey implemented on the Google platform	Database on individual health, physical activity and nature of work of employees
Physical activity		
The nature of labor		
Organizational and activity block		
A set of exercises of various directions and loads	Mobile application for Android and IOS	Individual physical activity programs for employees, dynamic correction of their content and intensity based on the results of ongoing monitoring
Algorithm for individual selection of exercises, taking into account the results of diagnostics		
Algorithm for load correction taking into account the results of current control		
Control block		
Monitoring the results of the implementation of the model	Questionnaire	Experimental confirmation of the effectiveness of the model
	Monitoring of motor activity	



Conclusions. The proposed scheme of the organization model of physical culture and health-improving activities of employees of remote industrial facilities based on information technologies allows achieving the set goals. During the implementation of the organizational and activity block, planning of various types and forms of physical exercises is carried out, taking into account the individual characteristics of health, physical activity and the nature of the work of employees. The result is a personalized training program. In the course of its implementation, an automated control over the state of students is carried out according to the criteria presented in the control block of the model.

The implementation of the model of organization of physical culture and health-improving activities of workers at remote industrial facilities based on information technology has confirmed its effectiveness in terms of improving the health and physical fitness of workers in remote northern regions, as well as in terms of forming motivations for physical activity and a healthy lifestyle.

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