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PSYCHOPHYSIOLOGICAL STATUS OF THE BODY OF WORKERS IN MINING AND PRODUCTION ASSOCIATION

Physiological researches of workers were carried out using the Eysenck test and the Spilberger-Khanin methodology at the Sokolovsko-Sarbaisky mining and production association (SSMPA).
Questionnaires were developed to assess the psychophysiological status of men in the dynamics of professional activity, which was the aim of this research.
Analysis of the psychophysiological status of the surveyed workers of the SSMPA allowed us to establish that:
The psychophysiological tension of the surveyed workers in the dynamics of the work shift is manifested by the predominance of inhibition processes, both in the auditory and visual zones of the cerebral cortex, and an increase in personal anxiety.
High rates of reactive anxiety were noted among the workers of the Sarbaisk ore management department (SOMD) (40.3 2.0 points), among the workers of the ore preparation department (OPPD) (40.0±1.5 points) and among workers of the motor transport department (MTD) (40.8± 1.9 points).
Keywords: *psychophysiological status, reactive anxiety, personal anxiety, inhibition, neuroticism, vertivation.*

Introduction.
In the strategy of the President of the Republic N.A. Nazarbayev "Kazakhstan-2030" indicated the need for a solution to the state program "People's Health". The main principles of the state policy of the Republic of Kazakhstan in the field of healthcare are ensuring national security, sanitary and epidemiological welfare of the population, responsibility of state bodies for creating conditions that ensure the preservation and strengthening of citizens' health.
The poor state of working conditions, the prevalence of heavy physical work, violations of work and rest regimes, low coverage and low-quality preventive medical examinations, the elimination of medical units and dispensaries, and a sharp decline in sanatorium and resort services are the cause of workers' health problems.
The working conditions of workers are directly reflected in the indicators of occupational morbidity and disability. Despite the fact that occupational diseases are less common than other underlying diseases, their social significance is great, since they affect a significant number of people of working age, are often proceed severely and cause disability.
In recent years, in connection with the creation of numerous joint-stock unions, associations, concerns, in connection with structural transformations in the management of enterprises, the issues of accounting and statistics of occupational morbidity have become much more complicated.
Therefore, one of the main tasks of preventive science at present is not only the prevention of the disease, but also the determination of the state of health at the stage of pre-illness, when the stage of unsatisfactory adaptation is noted. It is known that 40-50% of the population is exposed to various harmful factors during working process. The number of people in the "third state" of health makes up more than half of the total population (52-80%), and the greater number of them falls on the working age from 20 to 40 years.
Due to unsatisfactory working conditions and hygiene measures of protection, occupational morbidity and work-related injuries are detected in the republic, although the level of their registration differs markedly from year to year.
The largest number of occupational diseases are registered at enterprises of leading industries: coal, metallurgical and chemical. In addition to occupational morbidity, which occupies an insignificant place in the overall morbidity structure, the overall morbidity with temporary disability remains high, and the average life expectancy decreases. Among workers, the proportion of work-related diseases is growing and the number of women working in harmful conditions is increasing.
Currently, the pace of social, technological, environmental changes is increasing, requiring the individual to quickly adapt to the factors of the working environment. Features of the current socio-environmental situation in the context of economic reform and the country's transition to new forms of management have changed the structure and motivation of labor activity of all professional age groups of the working population. The current stage of development of society has led, on the one hand, to a sharp change in the human existence conditions, and on the other, to the development of sophisticated technologies that place high demands on the state of humans' health.
The purpose of the research is to assess the characteristics of changes in the psychophysiological status of men in the dynamics of professional activity.

Research results and discussion.
The objects of research were the industrial enterprises of "Sokolovsko-Sarbaisky Mining and Production Association" JSC in Kostanay city: the Sarbaisk ore management department (SOMD), Sokolovskoye underground ore management department (SUOMD), ore processing and preparation department (OPPD) and the motor transport department (MTD).
Research methods: physiological examination using the Eysenck test and the Spielberger-Khanin method, questionnaires for assessing the psychophysiological status.
The study of psychological characteristics showed that in the overwhelming majority of labor groups with an increased level of accident rate and injuries, the characteristics of group cohesion and integrativity are significantly lower than in groups working more safely.
In recent years, this problem has been solved by applying psychophysiological characteristics, such as speed and accuracy of response, individual properties of the nervous system, etc. The use of a complex of psychophysiological indicators characterizing the professional suitability of the organism of workers will make it possible to increase the working capacity, reliability and accident-free performance of professional activities.
Based on the tasks of the goal, we formed several groups of subjects, whose work is associated with modern technological progress under the influence of a complex of adverse production factors, including psychoemotional loads.

These included: workers in a quarry, in mines, in an enrichment factory and in motor transport department, whose professional activities require the maximum release of the information capacity of the higher parts of the brain for making emergency decisions, the inclusion of foresight and anticipation.

A whole complex of researches was used to study the psychophysiological state of the body of the subjects, including the study of the individual properties of the nervous system, personality traits, mental processes, cortical-subcortical relationships, which characterized the degree of adaptation of their body to the effects of production factors.

Studies of psychoemotional status were carried out according to the Eysenck test with the determination of the level of neuroticism and vertification in comfortable conditions before the presentation of loads. The degree of anxiety was determined by the Spielberger-Khanin method using the blank method, as the degree of tension of the mechanisms of mental adaptation associated with the activation of behavioral mechanisms, a sense of internal tension.

The ability to predict and correct the current state of the control object should be considered as one of the behavioral implementations of such general properties of the central nervous system as plasticity and sensitivity to a probabilistic environment, the ability to implement skills in the conditions of neuro-emotional stress, as manifestations of the activity property.

According to the nature of their vertification, the examined persons are mainly represented by the introverted type of personality (from 10.4 ± 0.7 points to 11.6 ± 1.0 points) and a high level of emotional instability, especially among workers of SUOMD and OPPD (table 1, figure 2).

Table 1 - Assessment of the Central nervous system of the subjects under the influence of noise interference, (M ± m)

Indicators	Sarbaisk OMD (n=130)	SUOMD (n=360)	OPPD (n=440)	MTD (n=180)
Emotional stability, point	12,6±1,0	13,3±0,9	13,4±0,8	12,3±2,6
Verification, point	10,4±0,7	10,6±1,1	11,4±1,1	11,5±1,1

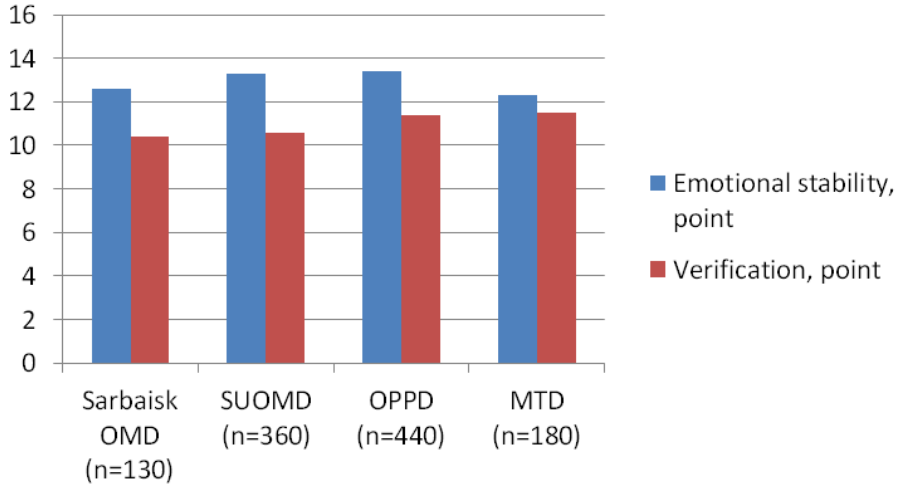

Figure 1 - Evaluation of indicators under the influence of noise interference

The average group values of anxiety indicators in all examined individuals ranged from 37.8 ± 3.7 to 44.5 ± 1.4 points, referring to the average anxiety group (table 2, figure 2).

Table 2 - Assessment of the Central nervous system of the subjects in low light conditions, (M ± m)

Indicators of CNS	Sarbaisk OMD (n=130)	SUOMD (n=360)	OPPD (n=440)	MTD (n=180)
Reactive anxiety (RA), point	37,8±3,7	43,3±2,0	40,0±1,5	40,8±1,9
Personal anxiety (PA), point	44,5±1,4	41,8±2,4	42,8±3,0	40,1±1,7

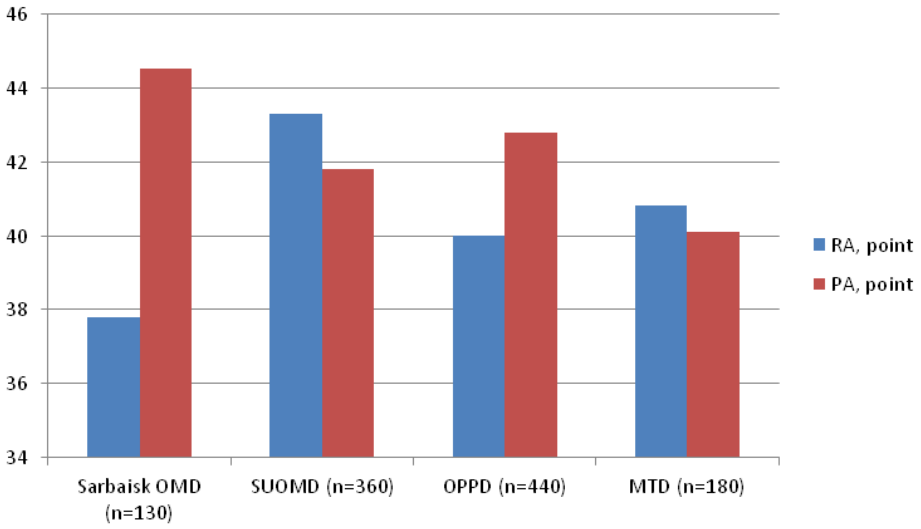

Figure 2 - Evaluation of indicators in low light conditions

The lowest RA values were found in Sarbaisk OMD workers (37.8 ± 3.7 points). Somewhat high RA indicators were noted among workers of SUOMD (40.3 ± 2.0 points), among workers of OPPD (40.0 ± 1.5 points) and among workers of MTD (40.8 ± 1.9 points).

These data indicate that workers are more likely to be affected by production stress situations. Higher PA indicators were observed for Sarbaisk OMD workers (44.5 ± 1.4 points) and OPPD workers (42.8 ± 3.0 points) compared to the rest of the analyzed groups. However, it is worth noting that PA indicator of SUOMD workers was higher compared to RA, which reflected their low self-esteem for the current real situation.

The rates of RA among SUOMD workers and PA among Sarbaisk OMD workers were higher than interviewed people (Table 2).

Testing results using psychodiagnostic tests showed that a significant number of examined individuals revealed violations of their psychological status, in the form of pronounced changes that combined into a syndrome of mental stress. The main symptoms of mental stress were indicators of anxiety.

The labor activity of underground coal miners requires great attention and concentration when performing labor operations.

It is known that with increasing in age and experience among workers exposed to adverse factors of production during the labor activity, both personal and reactive anxiety increase, health and mood deteriorate, disturbances in the functions of attention and perception appear.

It was established that an increase in anxiety manifests itself with an increase in the number of extraverted reactions. The most sensitive are people with a high level of neuroticism and anxiety, with a low degree of vertification.

It was revealed that in the process of labor activity, the examined workers were systematically subjected to psycho-emotional stress associated with excessive requirements of the technological process: a low level of control of the production situation, the lack of the possibility of changing and improving the technological process.

The revealed legitimacy is that the dynamic interaction in certain combinations of the predominance of the excitatory process and the reduced mobility of the inhibitory process characterizes the increased individual sensitivity of workers' body to the effects of production factors. The interaction of the predominance of the inhibitory process and a high level of mobility indicates a decrease in the body's stability, that is, a decrease in the adaptive potential.

The leading role in the mechanisms of the formation of adaptive-compensatory reactions of the body of workers of SSMPA belongs to indicators characterizing the balance of nervous processes and the mobility of the inhibitory process, the dynamic interaction of which determines an individual long-term adaptation strategy and determines the nature of sensitivity to the effects of production factors.

As a result of a physiological research, based on the obtained scientific results, features of psychophysiological status of the men of the main professions were studied and analyzed, the following was revealed: the psychophysiological stress of the surveyed workers in the dynamics of the work shift is manifested by the predominance of inhibition processes in both the auditory and visual zones of the cerebral cortex, and the growth of personal anxiety. High levels of RA were noted among SOMD workers (40.3 ± 2.0 points), among workers of OPPD (40.0 ± 1.5 points) and among workers of MTD (40.8 ± 1.9 points).

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ТАУ-КЕН ӨНДІРУ БІРЛЕСТІК ЖҰМЫСШЫЛАРЫНЫҢ ОРГАНИЗМІНІҢ ПСИХОФИЗИОЛОГИЯЛЫҚ КҮЙІ

Түйін: Айзенк тесті мен Спилберг-Ханин методикасы арқылы Соколов-Сарыбай кен-байыту өндірістік бірлестігінің (ССКӨБ) жұмысшыларына физиологиялық зерттеулер жүргізілді. Осы зерттеудің мақсаты болған ерлердің кәсіби қызмет динамикасындағы психофизиологиялық күйін бағалау үшін сауалнамалар құрастырылды.
Зерттелген ССКӨБ жұмысшыларының психофизиологиялық күйінің анализі мынаны анықтауға мүмкіндік берді:
Жұмыс ауысымындағы сұралған жұмысшыларының психофизиологиялық күйзелуі бас ми қабығының есту және көру зоналарындағы тежелу процесстерінің басымдылығымен, тұлғалық мазасыздануының өсімен айқындалады.
Сарыбай кен басқармасының жұмысшыларында (40,3 2,0 балл), кендайындау басқармасының жұмысшыларында (40,0 1,5 балл) және автокөлік басқармасының жұмысшыларында (40,8 1,9 балл) реактивті мазасызданудың жоғары көрсеткіштері белгіленген.
Түйінді сөздер: психофизиологиялық күй, реактивті мазасыздану, тұлғалық мазасыздану, күйзелу, нейротизм, вертирлену.

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ПСИХОФИЗИОЛОГИЧЕСКИЙ СТАТУС ОРГАНИЗМА РАБОЧИХ ГОРНО-ПРОИЗВОДСТВЕННОГО ОБЪЕДИНЕНИЯ

Резюме: Были проведены физиологические исследования с помощью теста Айзенка и методики Спилбергера-Ханина работающих на Соколовско-Сарбайском горно-производственном объединении (ССГПО). Разработаны анкетные карты для оценки психофизиологического статуса мужчин в динамике профессиональной деятельности, которая явилась целью данного исследования.
Анализ психофизиологического статуса обследованных рабочих ССПГО позволил установить, что:
Психофизиологическое напряжение опрошенных рабочих в динамике рабочей смены проявляется преобладанием процессов торможения, как в слуховой, так и зрительной зоне коры головного мозга, нарастанием личностной тревожности.
Высокие показатели реактивной тревожности отмечены у рабочих Сарбайского рудоуправления (СПРУ) (40,3 2,0 балла), у рабочих управления рудоподготовки (УРПО) (40,0 1,5 балла) и у рабочих автотранспортного управления (АТУ) (40,8 1,9 балла).
Ключевые слова: психофизиологический статус, реактивная тревожность, личностная тревожность, торможение, нейротизм, вертированность.