

**HYGIENIC ASSESSMENT OF WORKING CONDITIONS OF MEDICAL STAFF IN
PHYSIOTHERAPEUTIC ROOMS**

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Abstract:

This article examines the problems of hygienic assessment of working conditions of medical personnel in physiotherapy rooms involved in physiotherapy procedures for the purpose of rehabilitation of various population groups. The dynamics of the performance of medical workers during the working day and working week were studied. An assessment was made of the working conditions based on the indicators of harmfulness and danger of factors of the working environment of workers, the severity and intensity of the work process. Thus, the working conditions of medical personnel according to SanPiN RUz No. 0141-03 "Hygienic classification of working conditions based on indicators of harmfulness and danger of factors of the working environment, the severity and intensity of the work process" are classified as "harmful" class 3, 1-2 degrees

Keywords: Medical staff, physiotherapy procedures, professional risk, preventive medicine, class of working conditions, harmful factors, health of medical workers, physiotherapists.

Introduction

The staff of the physiotherapy department includes physiotherapists, physiotherapy nurses and orderlies.

The work of the physiotherapy department is managed by the head of the department, appointed from among the most qualified doctors, and in his absence - one of the doctors of the institution who have undergone special training in physiotherapy. He plans and ensures the work of the department, receives patients, monitors the correctness of the appointment of physiotherapy procedures, enters them in the procedure card, checks the correctness of their implementation, organizes advanced training of the staff, bears full responsibility for the quality and effectiveness of patient treatment. If there are physiotherapists on the staff in addition to the head of the department, they perform mainly medical work (3/4 of the working time).

A physiotherapist receives patients, supervises the work of the physiotherapy rooms assigned to him/her, monitors the condition of the equipment, instructs personnel on safety regulations, introduces attending physicians to new methods of physiotherapy, conducts health education work, etc. In their work, the head of the department and the physiotherapist are guided by the relevant standard regulations on positions approved by the Ministry of Health.

Only nurses with a certificate of specialization in physiotherapy are allowed to perform physiotherapy procedures. The nurse is responsible for the correct implementation of physiotherapy procedures. Familiarizes patients with the prescribed treatment and the rules for conducting, monitors the condition of patients during the procedure and the operation of the equipment, ensures the proper sanitary condition of the office. In the process of work, she must strictly adhere to safety regulations and be able to provide medical assistance. The nurse organizes the work of the junior staff of the office. The nurse's responsibilities also include keeping records of the work done and reporting on it.

The medical staff of the physiotherapy department has a reduced working day and additional annual leave. Medical staff working on UHF and laser therapy devices or in rooms where mud, hydrogen sulphide and carbon dioxide baths are used for treatment, as well as medical staff involved in the preparation of radon baths, are entitled to a salary supplement.

The high level of work stress and professional risk determine that work in such units is a nervous and stressful job, since it is characterized by a high degree of responsibility, a large volume of processed information, a deficit of motor activity (hypokinesia) and, in some cases, is distinguished by irrational organization. Therefore, the body's resistance to the listed and many other (household, environmental) factors is one of the most important and relevant problems for physiology and valeology.

Among the factors that can affect the well-being of workers in physiotherapy rooms, special attention is paid to visual strain associated with the use of various equipment, including computers, for 75-80% of the working day, and involves constant concentration, which often leads to the development of mental fatigue. Along with this, as a rule, the performance of such activities is accompanied by increased nervous and emotional stress. It is possible to prevent the development of diseases in these conditions only by creating favorable working conditions and a rational work and rest regime developed taking into account hygienic requirements.

During the study of the work activities of medical personnel of the FTC and FTO, the main harmful production factors were identified: sensory and intellectual loads, forced working position "sitting", bacterial contamination of the air in the premises, which requires the development of a set of health measures to optimize working conditions for this category of mental workers.

For a comprehensive assessment of the levels of harmful production factors, it is necessary to study their characteristics separately, taking into account the periods of the year, i.e. taking into account the workplaces and the time of the working day during which the studies were conducted.

The aim of this study was to conduct a comprehensive hygienic assessment of the working conditions of medical personnel working in physiotherapy rooms.

Research methods: During the work, generally accepted and tested research methods in occupational hygiene were used – sanitary and hygienic, laboratory and instrumental, and statistical.

Object and subject of the study. During the research work, the object of scientific research was the medical staff of the physiotherapy rooms of the 3rd clinic of the Tashkent Medical Academy (TMA) and the physiotherapy room of the Central Polyclinic No. 1 of the Yakkasaray district, family polyclinic No. 58 of Tashkent. The subject of the study was the levels of unfavorable factors in the warm and cold periods of the year, the severity and intensity of the labor process, characterizing the working conditions of medical workers.

When assessing the conditions of medical personnel of the studied facilities, it was established that the employees of the FTO and FTK are exposed to a complex of unfavorable factors of the production environment, of which the most influential are sensory and intellectual loads, forced working posture "from walking", monotony of loads associated with loads on the visual analyzer, which requires a comprehensive study of working conditions. At the same time, the levels of dust and gas contamination of the air in closed spaces were within the permissible values (class 2), but the combined effect of factors of the production environment can contribute to an increase in the effect of their impact.

Meteorological conditions at the workplaces of the subjects depend on the characteristics of the function performed, the location of the workplace, the local climate, the season, the design of the buildings and the availability of sanitary facilities. Air conditioning systems and thermal insulation also play a significant role here. These conditions are highly variable depending on meteorological conditions in the external environment.

The studies were conducted taking into account the periods of the year (warm and cold), a comparison of the values obtained when measuring meteorological conditions in the premises showed that they generally correspond to the permissible sanitary standards according to SanPiN RUz No. 0324-16 "Sanitary and hygienic standards for the microclimate of industrial premises") (Table 1).

Table 1 Average microclimate parameters in physiotherapy rooms

Measurement location	Warm period of the year			Cold season of the year		
	t, °C	V, m/s	Relative humidity, %	t, °C	V, m/s	Relative humidity, %
In the premises of the FTC	25-30	0.3	50-60	17-20	0.3	60-75
Permissible standards according to SanPiN No. 0324-16	22-30	0.3-0.7	40-60	17-23	no more than 0.3	75

Thus, the study of the microclimate at the workplaces of the medical personnel of the FTC and FTO allows us to conclude that its parameters comply with sanitary standards, both in the warm and cold periods of the year. During the hygienic assessment of working conditions based on microclimate indicators, the class of harmfulness and danger of working conditions was determined by the most pronounced indicator - air temperature. The class of working conditions

for workers for the category of work 1a, 1b in the warm and cold period of the year is acceptable, class 2.

Along with the meteorological factor, the noise level was measured in physiotherapy rooms, mainly arising during the operation of equipment and machinery, mechanical in origin, variable in time characteristics, and broadband in spectrum. A detailed study of the types of equipment, its location in rooms and workplaces made it possible to identify the main sources of minor noise, which are also winter-summer air conditioners. The results of the studies showed that the greatest excess of the maximum permissible level of equivalent noise during the operation of air conditioners is on average 66 dBA , with fluctuations at individual points on average from 55 to 64 dBA . When the air conditioning system is turned off, the noise intensity is lower and is 57 dBA , on average, with fluctuations from 60 to 75 dBA . The assessment of working conditions under the influence of industrial noise was carried out according to the degree of possible excess of permissible levels, while the working conditions are characterized as permissible, class 2, while excess of permissible noise levels was not observed, but its aggravation is possible with complex impact with other harmful factors leading to changes in the functional state of the body of workers.

To ensure successful visual work and active functioning of the body as a whole, it is important to create rational conditions for natural and artificial lighting. The work process in the studied FTK is associated with the strain of the visual organ, which places increased demands on the organization of lighting. The study of industrial lighting of the object under study showed that the lighting during the day is combined. Natural through side window light openings , artificial - general, with DRL lamps. The category of visual work of medical workers belongs to the III category of high accuracy, the background is from light to medium, accordingly, the contrast is from small to medium depending on the color characteristic used. The level of artificial illumination of the working surface met the hygienic requirements of KMK 2.01.05-98 "Natural and artificial lighting" , even at the workplaces of doctors FTK slightly exceeded the permissible values, which can cause some strain in the eye (Table 2).

Table 2 Average illumination values for key working doctors and nurses of the FTC

Workplace	Job category	Artificial general lighting, lx		Combined lighting KEO, %	
		measured	norm	measured	norm
Doctor	III	350	300	1,2	1 , 2
Nurses		30 0			

The research established that the medical staff of the FTC spends about 60% of their working time working on computer equipment (CT). Together with doctors from the physical laboratory of the Tashkent State Sanitary and Epidemiological Supervision Center, we used the NFM-1 device to establish that the EMF strength at a distance of 50 cm around the CT surfaces for the electrical component in the range of 5 Hz-2 kHz was 2.8-3.0 V /m (the maximum permissible level according to SanPiN RUz No. 0224-07 is no more than 2.5 V/m). The EMF strength at a distance of 50 cm around the surface of the video monitor for the magnetic component in the frequency range of 5 Hz-400 Hz was 5.2-5.3 A /m (with a maximum permissible level of no more than 5 A/m) (Table 3), which requires timely repair of the equipment used. In order to

reduce the levels of electrostatic fields, all metal structures of the CT are grounded. Thus, depending on At the EMF level, the working conditions of medical workers belong to class 3, degree 1 (harmful) class.

Table 3 Average values of EM P levels at the main working FTCs

Working place	EMF intensity			
	electric field, V/ m		magnetic field, A/ m	
	measured	norm	measured	norm
Doctor	2.8	2.5 (in the frequency range from 5 Hz-2 kHz)	5.2	5
Nurses	3.0		5.3	

The hygienic assessment of EMF at the workplaces of medical personnel in physiotherapy rooms showed that physiotherapy equipment is a source of electromagnetic fields and radiation of various physical parameters: electrostatic field, constant magnetic field, sinusoidal, pulse-modulated electric and magnetic fields, pulsed MF in a wide range of frequencies and intensities. The need for the development and metrological certification of control tools that allow for the hygienic assessment of the amplitude-frequency characteristics of broadband EMF and the assessment of the amplitude values of pulsed and pulse-modulated EMF in the radio frequency range is substantiated.

The professional activity of medical workers of these departments is accompanied by extensive contacts with pathogens of infectious diseases, high crowding of people. According to the available literary data, the analysis of bacteriological studies of air in doctors' offices revealed the presence of 4473.2 ± 57.4 colonies in 1 m³ · which exceeds the permissible norms. In 50% of cases, *S. epidermidis* was cultured , in 37.5% - *Sarcina* , in 43.8% - *S. Aureus* , in 37.5 % of cases - mold fungi.

Preventing the development of diseases in these conditions is possible only by creating favorable working conditions and a rational work and rest regime, developed taking into account hygiene requirements.

Based on the hygienic criteria and principles of classification of working conditions set out in the "Hygienic Classification of Working Conditions Based on Harmfulness and Hazard Indicators of Factors of the Production Environment, and the Severity and Intensity of the Work Process", we defined the class of working conditions for medical workers in physiotherapy rooms of polyclinics and clinics. The class of working conditions was determined based on the excess of the level of the harmful factor over permissible values, after which a general integral assessment of the working conditions of workers was derived.

The conducted time-keeping of the working day of the medical personnel of the FTK showed that the working conditions of medical workers have their own characteristics. Thus, in the professional activity of physiotherapists, the main place is occupied by the appointment of treatment (73.9%), registration of medical. documentation (12%), managing the work of mid-level medical personnel (8.5%) and providing advisory assistance to other doctors (5.6%) (Fig. 1). In the work of mid-level medical personnel, the picture looks like this: following doctors' orders (75%), monitoring the patient's well-being during the procedure and the operation of the

equipment (12%), preparing the equipment (10.6%), maintaining reporting and accounting documentation (2.4%) (Fig. 2).

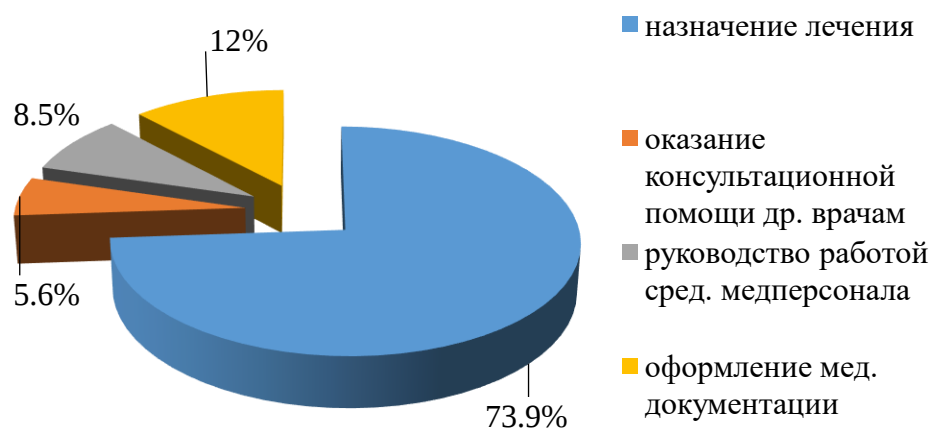


Fig. 1. Chronometric studies of the work process of FTK doctors

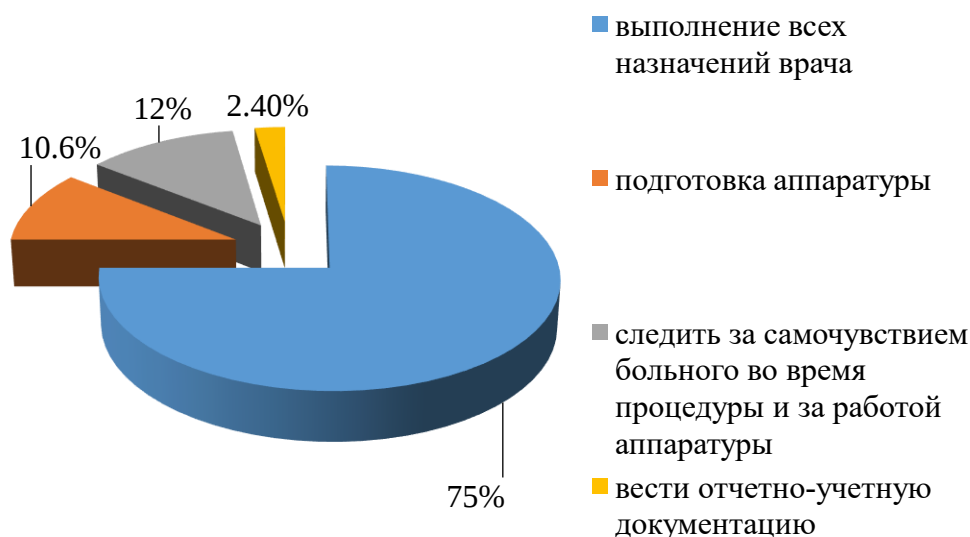


Fig. 2. Chronometric studies of the work process of nurses of the FTC

When studying the dynamics of the performance of medical workers during the working day and the working week, we found that the process of performing the main work accelerates at the 2nd and 3rd hour of the working day, and by the 4th hour, performance decreases. A study of the dynamics of performance during the working week showed that by the middle of the working week, performance indicators are especially high among doctors, and by the end of the week it decreases more significantly - among mid-level medical personnel.

We interviewed the medical personnel of the FTC of the studied medical institutions, they were asked questions according to the developed questionnaire (Appendix 1). The following peculiar pattern was established. To the question: what is the leading unfavorable harmful factor of the

labor process? The answers received showed that the most important factor that influenced the deterioration of health was nervous, highly stressful work (50%), the severity of the labor process (28%), unfavorable working conditions (22%).

To the second question: how do working conditions affect your health – the overwhelming majority of workers believe that their health has worsened because of working conditions. Half blame stressful and nervous work. The most popular health problem over the past year is chronic fatigue. Half of the respondents said that their health has worsened somewhat as a result of work. For a quarter (25%) of respondents, it has worsened significantly. Only 5% noted that they became healthier thanks to work.

Studying the structure of working day time expenditures, it was found that doctors spent more than 50% of their shift in an uncomfortable working position - "sitting" at a desk, performing their functional duties and filling out reporting and accounting documentation, which caused significant static loads on the cervical and lumbar spine and caused congestion in the pelvic organs, and difficulty in the functioning of the circulatory and respiratory organs.

Based on the above, it seems important, subject to compatibility with technology and working conditions, to combine work performed both standing and sitting. The choice of the optimal working posture should be made in such a way that workers can change their body position at their own discretion.

Among the indicators characterizing the work process in the FTC, one of the leading factors is stress. The assessment of the stress of work of a professional group of workers is based on the analysis of work activity and its structure, which are studied by means of chronometric observations in the dynamics of the entire working day, for at least one week. The analysis is based on taking into account the whole complex of factors (stimuli, irritants) that create prerequisites for the occurrence of unfavorable neuro-emotional states (overstrain). All factors (indicators) of the work process have a qualitative or quantitative expression and are grouped by types of loads: intellectual, sensory, emotional, monotonous, regime loads. Taking into account the presented data, the work of FTC doctors can be classified as harmful hard work of the 1st degree (3.1). Along with this, as a rule, the performance of such activities is accompanied by increased neuro-emotional stress and monotony. Deviations from the permissible values for the stress of the work process among physiotherapists classify it as class 3 of the 1st degree.

Based on the obtained data on the levels of harmful factors, an assessment was made of the working conditions based on the indicators of harmfulness and danger of factors of the working environment of workers, the severity and intensity of the work process. Thus, the working conditions of medical personnel according to SanPiN RUz No. 0141-03 "Hygienic classification of working conditions based on indicators of harmfulness and danger of factors of the working environment, the severity and intensity of the work process" are classified as "harmful" class 3, 1-2 degrees (Table 4).

Table 4 Class of working conditions of medical workers of the Federal Technical Commission according to indicators of harmfulness and danger of factors of the production environment, severity and intensity of the work process

Harmful factor	FTC Working Conditions Classes	
	Doctor	Nurse
Harmful substances	2	2
Microclimate	2	2
Light level	2	2
Noise	2	2
EMP	2	3.1
Heaviness labor process	3.1	2
Intensity of the work process	3.1	2
Integral assessment of working conditions	3.2	3.1

Taking into account the above, we have given a general integrated assessment of the working conditions of medical workers in physiotherapy rooms, taking into account the degree of harm and danger, severity and intensity of the work process.

Conclusion:

Conducting the above-presented studies to a certain extent made it possible to comprehensively and sufficiently fully provide a hygienic description of the main factors of the work of doctors and nurses, and to differentiate the studied working conditions according to the degree of deviation of the parameters of the production environment and the work process from the current hygienic standards in accordance with the possible impact of these deviations on the health of workers.

Based on the obtained data on the levels of harmful factors, an assessment was made of the working conditions based on the indicators of harmfulness and danger of factors of the working environment of workers, the severity and intensity of the work process. Thus, the working conditions of medical workers of the FTK according to SanPiN RUz No. 0141-03 "Hygienic classification of working conditions based on indicators of harmfulness and danger of factors of the working environment, the severity and intensity of the work process" are classified as "harmful" class 3, 1-2 degrees.

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