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МЕДИЦИНА И ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ

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MEDICAL AND SOCIAL FEATURES OF THE FORMATION OF INFECTIOUS MORBIDITY OF CHILDREN OF THE METROPOLIS

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ABSTRACT. The study of the features of infectious morbidity, especially during the spread of a new coronavirus infection, is of particular relevance in the organization of medical care to the population and ensuring anti-epidemic safety. A comprehensive study of the infectious morbidity of children aged 0-17 years in St. Petersburg in 2016–2020 was conducted. The indicators of infectious morbidity of the child population by groups of infectious diseases and individual nosologies, by different ages, living conditions and clusters of city districts were assessed. Differences in the sanitary state of the external environment in the districts of St. Petersburg were revealed, such as chemical contamination of surface waters in industrial and central areas, an increase in unsatisfactory samples of bacterial contamination, especially in the historical center, an unsatisfactory situation of chemical contamination of soils in industrial and residential areas. During the observation period, there was a decrease in the general infectious morbidity among children in the city, only in 2018 and 2019 an increase in this indicator was recorded in suburban areas. The highest incidence of intestinal infections was observed in residential areas, the lowest in suburban areas. While maintaining the general trend of reducing the incidence of acute viral hepatitis, an increase in industrial and suburban areas in 2017 and 2018 was noted. The highest flu incidence rates were in residential areas, the lowest — in the historical center. In all groups of districts of the city in 2020 compared to 2019 an increase in the incidence of viral pneumonia was recorded, the most significant in industrial and suburban areas. The incidence of mainly sexually transmitted infections in 2020 decreased in the city as a whole, but in residential, industrial and central areas there was an increase in the incidence of gonococcal infection. The study of the features of the formation of infectious morbidity will contribute to the optimization of organizational and anti-epidemic measures.

KEY WORDS: infectious morbidity; new coronavirus infection; children 0–17 years old; sanitary condition.

МЕДИКО-СОЦИАЛЬНЫЕ ОСОБЕННОСТИ ФОРМИРОВАНИЯ ИНФЕКЦИОННОЙ ЗАБОЛЕВАЕМОСТИ ДЕТЕЙ МЕГАПОЛИСА

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РЕЗЮМЕ. Изучение особенностей инфекционной заболеваемости, особенно в период распространения новой коронавирусной инфекции, приобретает особую актуальность при организации медицинской помощи населению и обеспечении противоэпидемической безопасности. Проведено сплошное исследование инфекционной заболеваемости детей 0–17 лет в Санкт-Петербурге в 2016–2020 годах. Оценке подлежали показатели инфекционной заболеваемости детского населения по группам инфекционных болезней и отдельным нозологиям, по различным возрастам, условиям проживания и группам районов города. Выявлены различия в санитарном состоянии внешней среды в районах Санкт-Петербурга, такие как химическая загрязненность поверхностных вод в промышленных и центральных районах, увеличение неудовлетворительных проб по бактериальной загрязненности, особенно в историческом центре, неудовлетворительная ситуация по химической загрязненности почв в промышленных и спальных районах. За период наблюдения отмечалось снижение общей инфекционной заболеваемости среди детей в городе, только в 2018 и 2019 годах зафиксирован подъем данного показателя в пригородных районах. Наибольший уровень заболеваемости кишечными инфекциями отмечен в спальных районах, наименьший — в пригородных. При сохранении общего тренда на уменьшение заболеваемости острым вирусным гепатитом отмечалось ее увеличение в промышленных и пригородных районах в 2017 и 2018 годах. Наибольшие показатели заболеваемости гриппом были в спальных районах, наименьшие — в историческом центре. Во всех группах районов города в 2020 году по сравнению с 2019 годом зафиксирован рост заболеваемости вирусной пневмонией, наиболее значимый — в промышленных и пригородных районах. Общая заболеваемость инфекциями, передающимися преимущественно половым путем, в 2020 году в целом в городе уменьшилась, однако в спальных, промышленных и центральных районах отмечался рост заболеваемости гонококковой инфекцией. Изучение особенностей формирования инфекционной заболеваемости будет способствовать оптимизации организационных и противоэпидемических мероприятий.

КЛЮЧЕВЫЕ СЛОВА: инфекционная заболеваемость; новая коронавирусная инфекция; дети 0–17 лет; санитарное состояние.

INTRODUCTION

Infectious disease morbidity is an indicator of national security. It is one of the main causes of temporary disability of the working population, including care for a sick family member (child).

It is a well-known fact that the incidence of infectious diseases in the general population and individual socio-age groups is characterized by irregularity over time. Long-term dynamics is characterized by epidemic tendency, cyclicity and irregular (episodic) rises and (or) falls of morbidity. Epidemics develop during wars, after natural disasters, in case of neglect in highly effective anti-epidemic measures [1, 4, 5].

The year 2020 is notable for the epidemic spread of new coronavirus infection (NCVI),

which has reached a near-pandemic scale in all parts of the globe [6, 11].

Pandemic (Greek Πανδημία — the whole nation) is an unusually severe epidemic spread across countries and continents; the highest degree of development of the epidemic process. Pandemic is the most dangerous form of a new disease spreading on a worldwide scale. According to the criteria of the World Health Organization (WHO), a pandemic is the spread of a new disease worldwide [2, 10]. 5 million people became victims of the new Coronavirus infection (NCVI) in two years; more than 250 million (about 3% of the world's population) suffered from the disease in various forms. The pandemic led to an economic crisis, widespread quarantines, use of protective masks and, since the beginning of 2021, mass vaccination.

The incidence of acute respiratory infections and other infectious diseases continues to be recorded during the NCVI pandemic. The quarantine closure of a large number of preschool educational organizations (PEOs) and the switch to a distance learning mode in 2020 had a significant impact on the infectious disease incidence among the child population of St. Petersburg. At the same time, there are significant differences in infectious morbidity in general and by individual nosologies in different districts of the city.

AIM

To analyze the infectious morbidity of children 0–17 years old, to estimate the prevalence of infectious morbidity among the child population of St. Petersburg in 2016–2020, to evaluate the distribution of various nosologies of some infectious and parasitic diseases which depend on the medico-economic and medico-social characteristics of the districts in St. Petersburg, to assess the state of infectious morbidity of the child population in the analyzed groups.

MATERIALS AND METHODS

The research was conducted to retrospectively study the infectious morbidity of children 0–17 years old in St. Petersburg in 2016–2020, according to the conditions of residence and districts of the city. Following statistical observation forms have been analyzed: form No. 1 "Information about infectious and parasitic diseases", form No. 2 "Information about infectious and parasitic diseases", form No. 23–17 "Information about outbreaks of infectious diseases", form No. 18 "Information about the sanitary condition of the subject of the Russian Federation" [9]. The study was conducted by a continuous method. It covered the indicators of infectious morbidity of the child population in the period from 2016 to 2020. Various groups of the research included infectious diseases and individual nosologies in different ages and districts.

The principles of grouping neighborhoods of residence in St. Petersburg are presented. The neighborhoods of St. Petersburg are conditionally divided into 4 groups.

The 1st group is "Dormitory districts". This is the largest group in terms of adult and child population (the child population is more than 478 thousand children 0–17 years old). The group includes Vyborgsky, Kalininsky, Krasnoselsky, Primorsky, Frunzensky districts. These are the districts with the largest development and formation of housing stock.

The 2nd group — "Industrial districts". It is formed by Kirovsky, Krasnogvardeysky, Moskovsky and Nevsky districts. The average annual child population is more than 295 thousand children. The group is characterized by the highest level of industrial production.

The 3rd group includes the districts of the historical center: Admiralteysky, Vasileostrovsky, Petrogradsky, Tsentralny, with a child population of more than 112 thousand. The group is characterized, on the one hand, by the presence of a large number of communal (shared) apartments, and hence migration flows, and on the other hand, by a large volume of elite housing, transport flows, and an extended network of restaurants and cafes. This group is also characterized by the presence of a great number of medical and educational organizations in adapted buildings and premises built in the XVIII–XIX centuries, and in some cases these premises do not meet sanitary requirements.

Group 4 — "Suburban districts". This group includes Kolpinsky, Kronstadt, Kurortny, Petrodvortsovy, Pushkinsky districts of St. Petersburg. The group is characterized by the lowest population density and satisfactory environmental and hygienic indicators.

RESULTS AND DISCUSSION

St. Petersburg is located on 42 islands of the Neva River delta on the eastern coast of the

Gulf of Finland. St. Petersburg is currently divided into 18 administrative districts. In recent years, residential areas have been developing in all directions from the historical center of the city. The area of the city is more than 606 km^2. The nearest suburbs are located on the lowlands of the Neva River, they stretch along the bay — 1439 km^2 [3]. Population density in 2020 — 3837.73 people/km^2.

The quality of the environment in the region is determined by air and water pollution, land, waste accumulation, the state of green spaces and many other factors. Air basin pollution is determined by the mass of pollutant emissions from stationary and mobile sources. The main polluters of the city's atmosphere are enterprises of fuel and energy complex, metallurgy, metal processing and motor transport. A significant contribution to the air pollution of the city is made by transit transport, which is not recorded, however, its increase is noticeable. In general, the level of air pollution in the city is below the average in Russia. It is one of the lowest among the cities with more than 1 million of inhabitants (Table 1) [3].

The current research assesses the city districts in 2016 and 2020 by separate spheres of life: socio-demographic; health care (development of the network of medical organizations (MOs) and organization of medical support for children and adolescents); socio-economic; environmental and hygienic.

The presented data indicate the improvement of air quality in the city districts during the research.

The main source of water supply in St. Petersburg and its nearest suburbs is the Neva River. A number of suburban areas are supplied with water from underground sources (Krasnoselsky, Kurortny, Petrodvortsky, Pushkinsky districts). The quality of surface waters of St. Petersburg is mainly determined by the quality of natural waters flowing into the city as well as wastewater discharged [3].

The survey of underground water supply sources in Krasnoselsky district (classified as a group of dormitory districts) performed in 2016 showed both chemical and bacterial contamination in 85.7 and 3.6% of samples according to the Form No. 18 "Information on the sanitary condition of the subject of the Russian Federation". In 2020, bacterial contamination was not registered, and chemical contamination almost halved to 43.8% of samples. In three districts categorized as suburban (Kurortny, Pushkinsky and Petrodvortsovy), both chemical and bacterial contamination of underground water supply sources was also detected. In 2016, it amounted to 52.08 and 2.08%, respectively. In 2020, chemical contamination in suburban areas decreased

Table 1

Air quality in 2016 and 2020 (according to Form No. 18 "Information on the sanitary condition of the subject of the Russian Federation")

Таблица 1

Качество воздушной среды в 2016 и 2020 гг. (по данным формы № 18 «Сведения о санитарном состоянии субъекта Российской Федерации»)

Groups of districts / Группы районов /	2016			2020		
	Total research / Всего исследований	Number of unsatisfactory samples / Количество неудовлетворительных проб	% of unsatisfactory samples / % неудовлетворительных проб	Total research / Всего исследований	Number of unsatisfactory samples / Количество неудовлетворительных проб	% of unsatisfactory samples / % неудовлетворительных проб
Group 1 / 1-я группа	12 914	10	0,39	6500	0	0
Group 2 / 2-я группа	11 506	7	0,24	7450	0	0
Group 3 / 3-я группа	5615	30	2,14	3700	0	0
Group 4 / 4-я группа	6544	0	0	3350	0	0

more than 2-fold (to 24.14%), while bacterial contamination was not registered. These areas are characterized by the presence of private households, centralized and personal water supply systems.

In 2016 surface water supply sources have been examined for chemical, bacteriological and parasitic contamination. In 2016, as well as in 2020, 100% of surface water samples in dormitory districts were unsatisfactory in relation to bacterial contamination. The bacterial contamination in industrial districts increased from 75% of samples to 100%, in 2020 100% of samples were unsatisfactory concerning chemical contamination. Water samples in the historical center districts showed a significant increase in unsatisfactory results. The quality of water supply from surface sources in 2020 cannot be called satisfactory both by chemical and bacteriological components in all groups of districts (Table 2).

The condition of soils in different districts was analyzed as well. The main sources of pollution in St. Petersburg are industrial emissions, dust from construction sites and roads, waste disposal sites, garbage dumps, groundwater, and atmospheric precipitation. During the entire research, the unsatisfactory situation with regard to soil contamination by chemical pollutants (copper, lead, zinc, tin, tungsten, nickel, chromium) was recorded in industrial areas. The soil contamination in dormitory districts increased more than 2 times during the research period. Suburban areas and the historical center of the city were characterized by more favorable indicators of soil pollution (Table 3).

There have been performed the analysis of housing provision of the population in different districts of the city over a ten-year period (in 2010 and 2020).

In 2010, the highest housing provision (in m^2 per 1 inhabitant) is in the 2nd and 3rd groups (industrial districts and the historical center). The lowest is in suburban areas (Group 4). The highest population density is in industrial districts and the historical center, the lowest — in suburban areas (Table 4) [12].

In 2020, in all groups of districts except for the historical center, an increased provision of housing per 1 inhabitant from 18.4 to 19.9 m^2 is registered. At the same time there is a decrease in this indicator from 15.8 to 10.3 m^2 in group 3 (historical center). It should be noted that population density in group 3 increased (from 5692.9 in 2010 to 5796.8 in 2020) whereas the housing stock decreased, presumably due to the

Table 2

Surface water quality in 2016 and 2020 (according to Form No. 18 "Information on the sanitary condition of the subject of the Russian Federation")

Таблица 2

Качество поверхностных вод в 2016 и 2020 годах (по данным формы № 18 «Сведения о санитарном состоянии субъекта Российской Федерации»)

Groups of districts / Группы районов	2016						2020					
	Total chemical samples / Всего химических проб	% of unsatisfactory / % неудовлетворительных	Total bacteriological samples / Всего бактериологических проб	% of unsatisfactory / % неудовлетворительных	Total parasitological samples / Всего паразитологических проб	% of unsatisfactory / % неудовлетворительных	Total chemical samples / Всего химических проб	% of unsatisfactory% / неудовлетворительных	Total bacteriological samples / Всего бактериологических проб	% of unsatisfactory / % неудовлетворительных	Total parasitological samples / Всего паразитологических проб	% of unsatisfactory / % неудовлетворительных
Group 1 / 1-я группа	13	0	12	100	12	8,3	12	0	12	100	12	0
Group 2 / 2-я группа	24	0	24	75	24	0	24	100	24	83,3	24	0
Group 3 / 3-я группа	12	0	12	0	12	0	12	100	12	91,7	12	0
Group 4 / 4-я группа	24	0	24	83,3	23	50	24	8,3	24	100	24	0

Table 3

Soil quality in groups of districts in 2016 and 2020
(according to Form No. 18 "Information on the sanitary condition of the subject of the Russian Federation")

Таблица 3

Качество почвы в группах районов в 2016 и 2020 годах
(по данным формы № 18 «Сведения о санитарном состоянии субъекта Российской Федерации»)

Groups of districts / Группы районов	2016				2020			
	Total chemical samples / Всего химических проб	% of unsatisfactory / % неудовлетворительных	Total bacteriological samples / Всего бактериологических проб	% of unsatisfactory / % неудовлетворительных	Total chemical samples / Всего химических проб	% of unsatisfactory / % неудовлетворительных	Total bacteriological samples / Всего бактериологических проб	% of unsatisfactory / % неудовлетворительных
Group 1 / 1-я группа	1871	1,44	1871	0	588	3,23	588	0
Group 2 / 2-я группа	1360	1,32	1360	0	324	1,50	324	0
Group 3 / 3-я группа	1230	1,14	1230	0	290	0,02	290	0
Group 4 / 4-я группа	1101	0	702	0	359	0,01	359	0

Table 4

Provision of housing for the population of groups of districts of St. Petersburg in 2010 (m^2)

Таблица 4

Обеспеченность жильем населения групп районов Санкт-Петербурга в 2010 году ($м^2$)

Groups of districts / Группы районов	Total population / Все население	Children's population / Детское население	Living area (m^2) / Жилая площадь ($м^2$)	Population density (km^2) / Плотность населения ($км^2$)	Housing provision for 1 resident (m^2) / Обеспеченность жильем 1 жителя ($м^2$)	Number of rooms per 1 resident / Число комнат на 1 жителя
Group 1 / 1-я группа	2 191 766	295 114	27759,1	4796,8	12,7	0,8
Group 2 / 2-я группа	1 424 249	207 834	19 210	6015,4	13,5	0,9
Group 3 / 3-я группа	706 035	98 671	11 186,8	5692,9	15,8	0,9
Group 4 / 4-я группа	555 171	88050	6486,8	1100,4	11,7	0,8
St. Petersburg / Санкт-Петербург	4 877 221	705 910	64642,7	3467,4	13,3	0,9

transfer of housing stock into non-residential, a large number of shared apartments and an increase in population due to external migration, which affects the increase in population density (Table 5) [12].

Primary health care (PHC) for children in St. Petersburg, including primary specialized care, is provided at 1,170 pediatric areas in 79 children's outpatient polyclinics, among them 16 are children's city outpatient clinics and 63 are children's outpatient departments. In addition, primary health care for children is provided in 20 offices of general medical practice, and primary specialized medical care is provided in

Table 5

Provision of housing for the population of groups of districts of St. Petersburg in 2020 (m^2)

Таблица 5

Обеспеченность жильем населения групп районов Санкт-Петербурга в 2020 году ($м^2$)

Groups of districts / Группы районов	Total population / Все население	Children's population / Детское население	Living area (m^2) / Жилая площадь ($м^2$)	Population density (km^2) / Плотность населения ($км^2$)	Housing provision for 1 resident (m^2) / Обеспеченность жильем 1 жителя ($м^2$)	Number of rooms per 1 resident / Число комнат на 1 жителя
Group 1 / 1-я группа	2 413 403	478 459	47815, 6	5281,9	19,8	1,2
Group 2 / 2-я группа	1 576 132	295 313	31 307,6	6656,9	19,9	1,3
Group 3 / 3-я группа	718 919	112 292	7 429,6	5796,8	10,3	0,6
Group 4 / 4-я группа	675 436	140 149	12 773,3	1338,8	18,9	1,3
St. Petersburg / Санкт-Петербург	5 398 100	1 026 213	99 326,1	3837,7	18,4	1,3

Table 6

Provision of primary health care for children aged 0–17 from groups of districts of St. Petersburg in 2020 (%)

Таблица 6

Обеспеченность первичной медико-санитарной помощью детей 0–17 лет из групп районов Санкт-Петербурга в 2020 году (%)

Groups of districts / Группы районов	The number of children aged 0–17 years (abs. h.) / Численность детского населения 0-17 лет (абс. ч.)	The number of pediatric sites / Число педиатрических участков	Staffing with district pediatricians (%) / Укомплектованность врачами-педиатрами участковыми (%)	Provision with district pediatricians (per 10,000 population) / Обеспеченность врачами-педиатрами участковыми (на 10 000 населения)
Group 1 / 1-я группа	478 459	554	94,4	13,25
Group 2 / 2-я группа	295 313	328	94,1	12,16
Group 3 / 3-я группа	112 292	131	91,7	11,31
Group 4 / 4-я группа	140 149	157	91,4	11,0
St. Petersburg / Санкт-Петербург	1 026 213	1170	93,7	12,38

consultative and diagnostic centers, including medical organizations of federal subordination, specialized early treatment and prevention center, outpatient and consultative departments of city hospitals, and dental clinics [7, 8].

There have been performed an analysis of medical organizations providing primary health care to children, namely their staffing with district pediatricians and the availability of district pediatricians. In relation to the number of district pediatricians, the first and second ranks belong to the 1st and 2nd groups of districts: 13.25 and 12.16 per 10,000 children, respectively. The staffing level of district pediatricians is over 90% in all groups of districts (Table 6) [8].

The highest level of availability of district pediatricians is noted in the districts where the construction of new housing is accompanied by

the development of health care infrastructure, commissioning of new polyclinics and general practitioners' centers.

The minimum level of provision is noted in the group of suburban areas, where the development of medical infrastructure lags behind the growing demand of the population. At the same time, taking into account the lowest density of children's population, this group has the greatest "elbow of access" to children's polyclinics. The peculiarity of the 3rd group of districts (the historical center) is high population density, low provision with housing per 1 inhabitant and the 3rd place in terms of staffing with pediatricians.

Analyzing the growth/decline of the child population, a decrease in the number of children 0–17 years old in the 3rd group of districts by 1.85% was noted. The maximum increase in the number of children aged 0–17 years was observed in dormitory and suburban districts (16.4% and 21.6% growth in dynamics, respectively).

Thus, our conditional mapping of St. Petersburg districts and their grouping according to the studied qualitative criteria confirmed the assumptions about significant differences in the levels of infectious morbidity of children in all groups of districts during the research. It is worth noting that the overall infectious morbidity of children for 2016–2020 decreased by 32.9%, the largest decrease was recorded in the group of sleeping areas (35.3%), in the group of the historical center (37.0%), industrial areas (36.0%), and the smallest — in suburban areas (13.5%) (Fig. 1).

At the same time, while the general trend towards a decrease in overall infectious morbidity for all groups of districts was preserved, a significant decrease in the indicator was noted precisely in 2020 (–22.1% compared to 2019). The peculiarity of 2020 was the epidemic spread of a new coronavirus infection. The introduction of restrictive measures, including full distance learning and shutdown of public catering enterprises had a significant impact on the reduction of infectious morbidity.

An analysis of infectious morbidity was carried out by following groups of infections in the

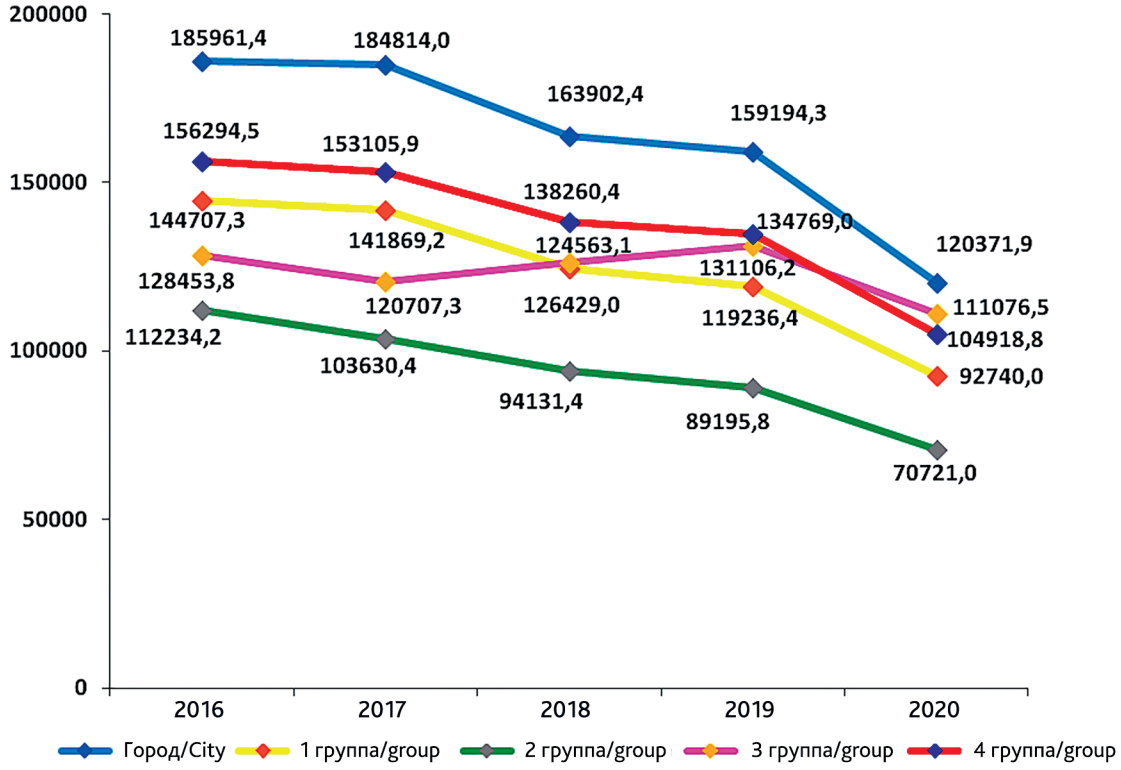

Fig. 1. Total infectious morbidity of children aged 0–17 years in 2016–2020 in groups of districts and in St. Petersburg as a whole (per 100,000 children)

Рис. 1. Общая инфекционная заболеваемость детей 0–17 лет в 2016–2020 годах в группах районов и в целом по Санкт-Петербургу (на 100 000 детей)

districts: incidence of intestinal infections (including bacterial dysentery), acute viral hepatitis, respiratory tract infections (acute respiratory infections, influenza, viral pneumonia), gonococcal infection, active tuberculosis.

The conducted analysis showed a similar trend to the decrease in general infectious morbidity — a decrease in the incidence of intestinal infections in 2020 in all groups of districts compared to 2016: by 45.0% in Group 1, 41.0% in Group 2, 40.1% in Group 3 and 35.0% in Group 4. At the same time, the highest incidence of intestinal infections was observed in the group of sleeping areas, the lowest — in suburban areas, with no significant differences between the groups of districts (Fig. 2).

Estimating the age structure of morbidity with intestinal infections, it was noted that the most prevalent group was the age of 3–6 years, 27.4% — on 7–14 years, 20% — on 1–2 years (Table 7).

Two infections from the group of intestinal infections — bacterial dysentery and viral hepatitis A were selected for the analysis as they were the most significant in epidemiological terms.

In 2019, the highest incidence of bacterial dysentery was recorded in the 2nd and 3rd groups of districts, however, in 2020, the incidence of bacterial dysentery was maximally reduced by 80% in these groups. At the same time, the morbidity in the suburban areas was lower than in other groups throughout the analyzed period (Fig. 3).

Analyzing the incidence of bacterial dysentery in children, data were obtained indicating significant differences in the prevalence of bacterial dysentery in all groups of districts. Thus, all groups of districts showed an increase in incidence in 2018, but the highest rate of was recorded in industrial districts (260.1%). In 2019, the outbreak was recorded in the central districts, where the incidence increased by 54.5% compared to 2018.

Over the five-year period, the city as a whole showed a decrease in the incidence of acute

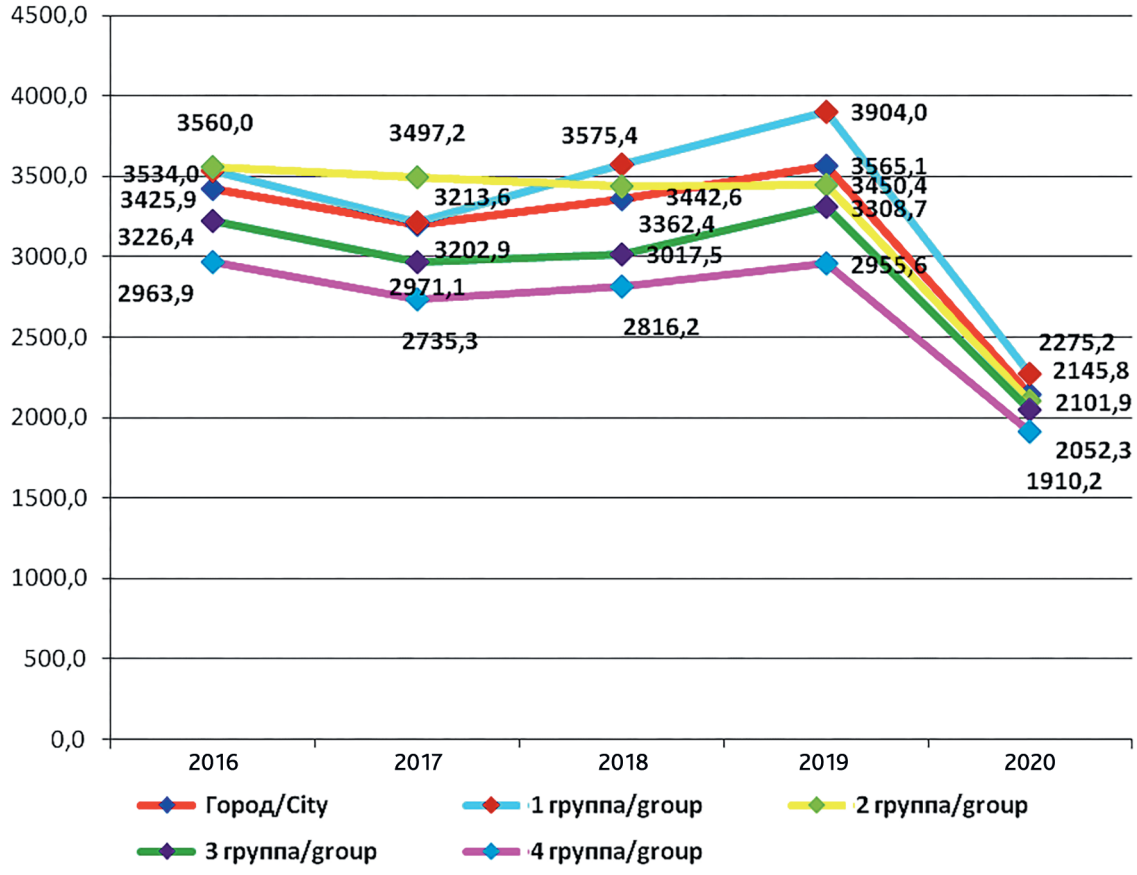

Fig. 2. Incidence of intestinal infections in children aged 0–17 years in 2016–2020 in St. Petersburg (per 100,000 children)

Рис. 2. Заболеваемость детей 0–17 лет кишечными инфекциями в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

Table 7

The average annual age structure of the incidence of certain infectious diseases of children 0–17 years old in St. Petersburg in 2016–2020 (summary data for five years,%)

Таблица 7

Среднегодовая возрастная структура заболеваемости некоторыми инфекционными болезнями детей 0–17 лет в Санкт-Петербурге в 2016–2020 году (сводные данные за пять лет,%)

Nosology / Нозология	Up to 1 year / До 1 года	1–2 years / 1–2 года	3–6 years / 3–6 лет	7–14 years / 7–14 лет	15–17 years / 15–17 лет	Total% / Итого%
General infectious morbidity / Общая инфекционная заболеваемость	8,8	20,0	36,4	27,6	7,2	100
Group of intestinal infections / Группа кишечных инфекций	13,7	27,7	29,6	22,5	6,5	100
Dysentery / Дизентерия	2,8	17,0	33,8	32,8	13,6	100
Acute viral hepatitis / Острый вирусный гепатит	5,4	16,7	28,0	36,6	13,3	100
Respiratory tract infections / Инфекции дыхательных путей	8,8	19,9	36,6	27,4	7,3	100
Acute respiratory infections / ОРЗ	11,8	24,6	33,8	22,4	7,4	100
Flu / Грипп	8,2	22,4	35,2	26,1	8,1	100
Viral pneumonia / Вирусная пневмония	7,0	24,3	31,3	22,3	15,1	100
Parasitic infections / Паразитарные инфекции	0,2	3,6	28,8	64,0	3,4	100
Gonococcal infection / Гонококковая инфекция	0	0	5,0	10,2	84,8	100
Active tuberculosis / Активный туберкулез	1,7	11,0	27,3	43,6	16,4	100

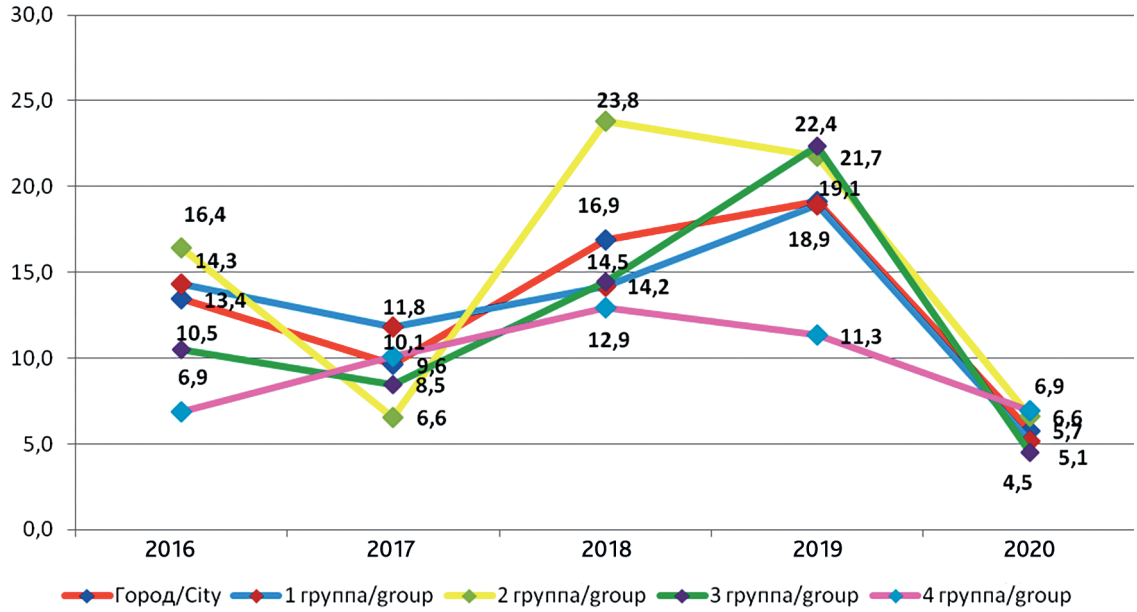

Рис. 3. Заболеваемость детей 0–17 лет бактериальной дизентерией в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

Fig. 3. Incidence of bacterial dysentery in children aged 0–17 in 2016–2020 in St. Petersburg (per 100,000 children)

viral hepatitis by 86.9%. While maintaining the general trend on decreasing, there was an increase in incidence compared to 2016 in the group of industrial areas (in 2017 by 58.2%) and suburban areas (in 2018 by 2 times). These groups of districts had the highest percentage of unsatisfactory bacteriologic samples of soil and surface water. At the same time, single cases

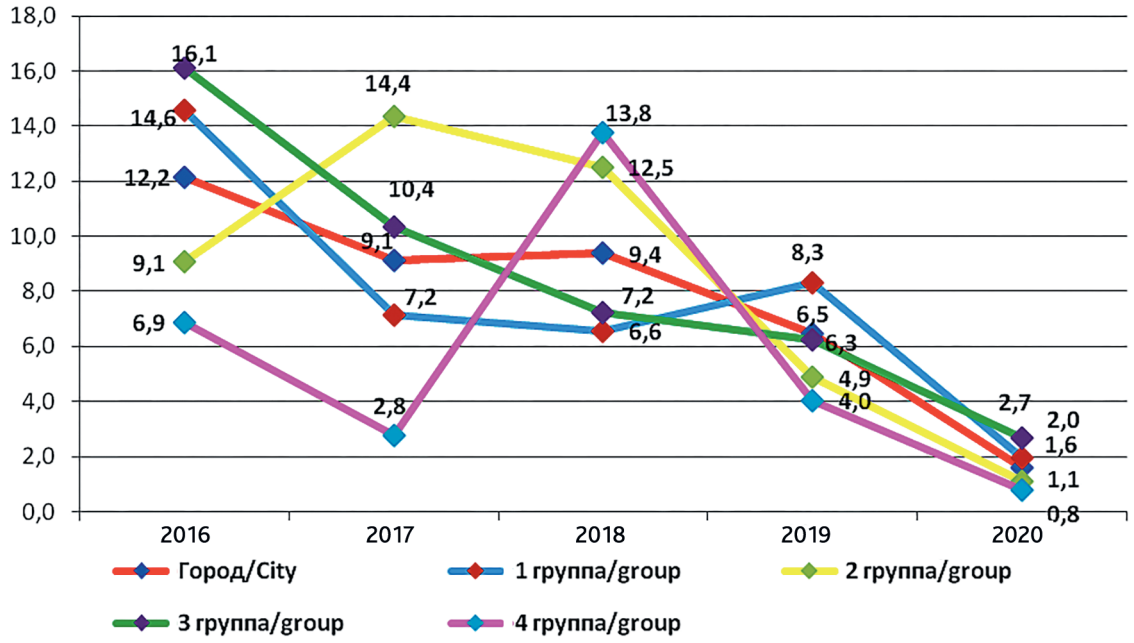

Fig. 4. Incidence of acute viral hepatitis in children 0–17 years old in 2016–2020 in St. Petersburg (per 100,000 children)

Рис. 4. Заболеваемость острым вирусным гепатитом детей 0–17 лет в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

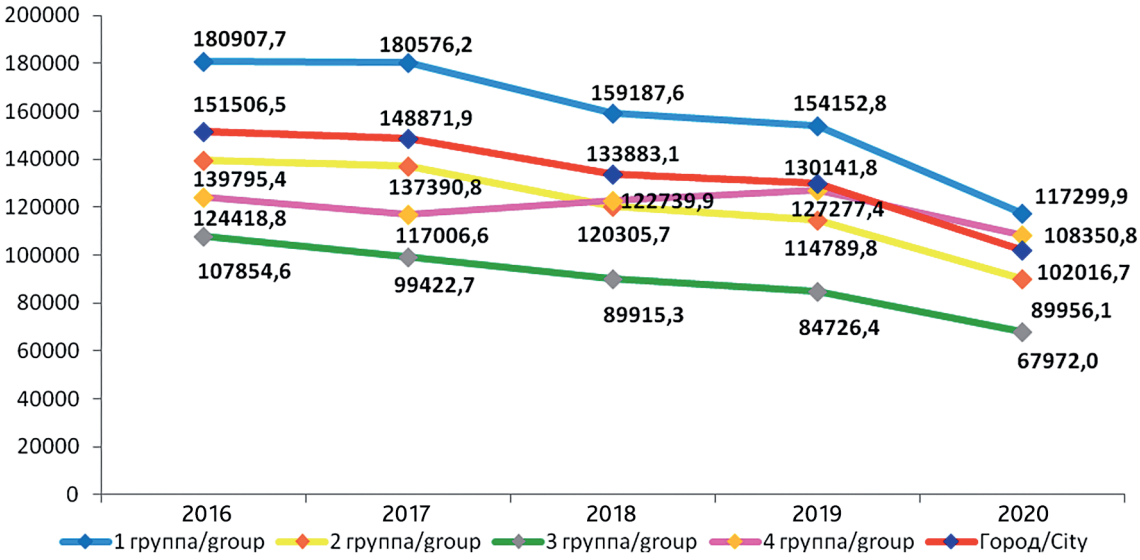

Fig. 5. Incidence of respiratory tract infections in children aged 0–17 in 2016–2020 in St. Petersburg (per 100,000 children)

Рис. 5. Заболеваемость детей 0–17 лет инфекциями дыхательных путей в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

are recorded in all groups of districts in 2020 (Fig. 4).

The most common group of infections is respiratory tract infections. This group takes the leading place among the total infectious morbidity. Over the five-year period, the share of respiratory tract infections in St. Petersburg decreased by 32.7%. While the general trend towards a decrease in infectious morbidity in 2020 was maintained, there was an increase in the specific weight of respiratory tract infections in the group of suburban areas during 2018–2019: in 2019 compared to 2017, the increase amounted to 8.8%. A significant difference in the incidence of respiratory tract infections between the groups of districts was revealed, in particular,

the incidence in group 1 in 2020 was 1.7 times higher than in group 3 (Fig. 5).

Several individual nosological forms that play the most significant role in the morbidity of respiratory tract infections have been identified. Influenza and other acute respiratory viral infections account for 91.2% in the structure of all infectious diseases.

It was noted that the increase in influenza incidence among children has been risen in all groups of the districts since 2017, while the incidence of respiratory tract infections decreased. It was established that the highest rates of influenza morbidity were observed in the central districts, and the lowest — in suburban districts. Analyzing influenza incidence in 2020 compared to 2019, a pronounced increase in incidence was observed in all groups of neighborhoods, from 24.8% in suburban areas to 73.2% in industrial areas. At the same time, the highest incidence in 2020 was registered in the group of the historical center (215.5 per 100,000 children 0–17 years old), the lowest in the group of suburban areas (83.9) (Fig. 6).

Due to the COVID-19 epidemic, a significant increase in viral pneumonias among children was observed in 2020 compared to 2019 (20.7 times). The same trend was observed in all groups of city neighborhoods. Within the period from 2016 to 2019 no cases of viral pneumonias were recorded in suburban, central and industrial districts. In 2020 there was a sharp rise of the pathology in all groups of districts: in group 1 by 21.5 times, in group 2 by 26.7 times, in group 3 by 31.9 times, in group 4 by 10.6 times (Fig. 7).

Among predominantly sexually transmitted infections (PSTIs), gonococcal infection manifested in St. Petersburg in 2020, with an increase of 32%. The greatest increase in the incidence of the infection occurred in industrial (17.3 times), dormitory (24 times) and central

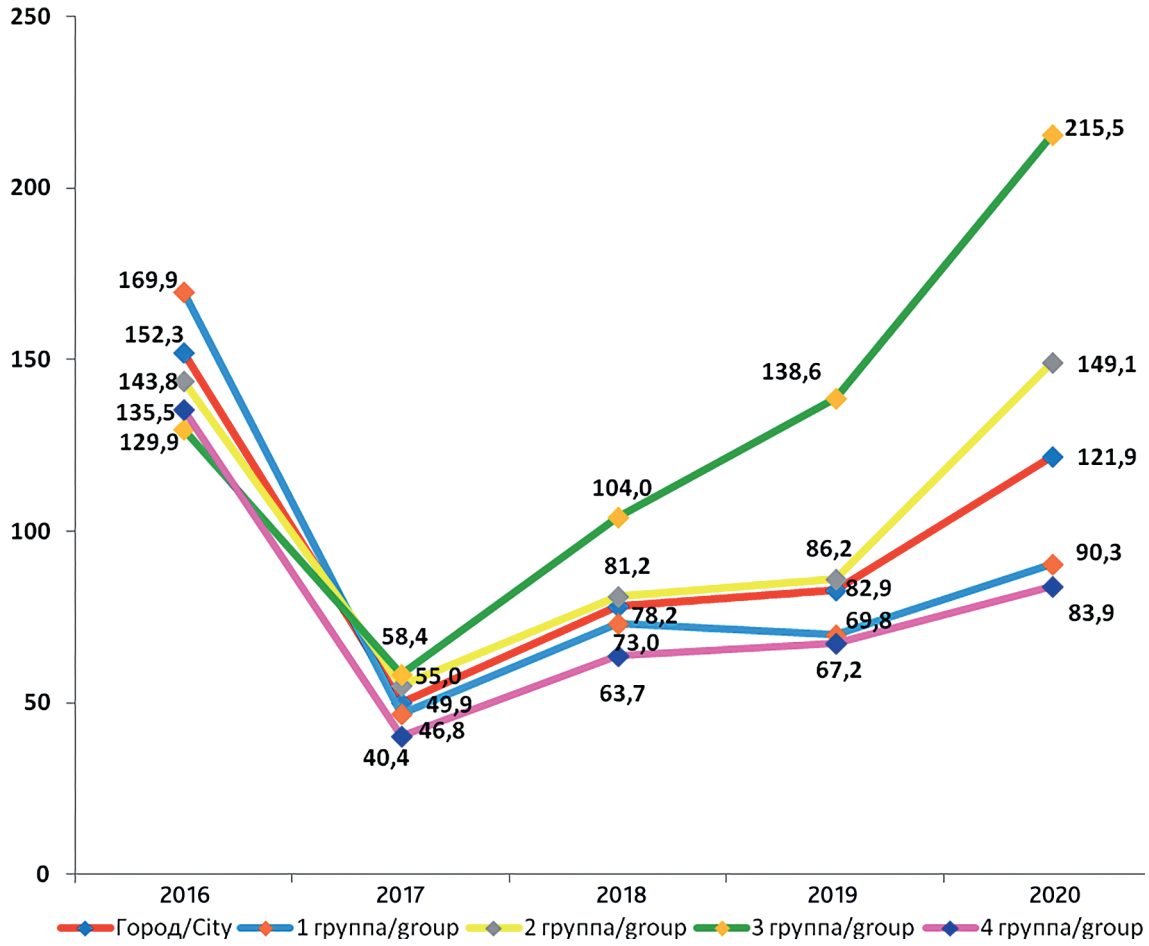

Fig. 6. Incidence of influenza in children 0–17 years old in 2016–2020 in St. Petersburg (per 100,000 children)

Рис. 6. Заболеваемость гриппом детей 0–17 лет в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

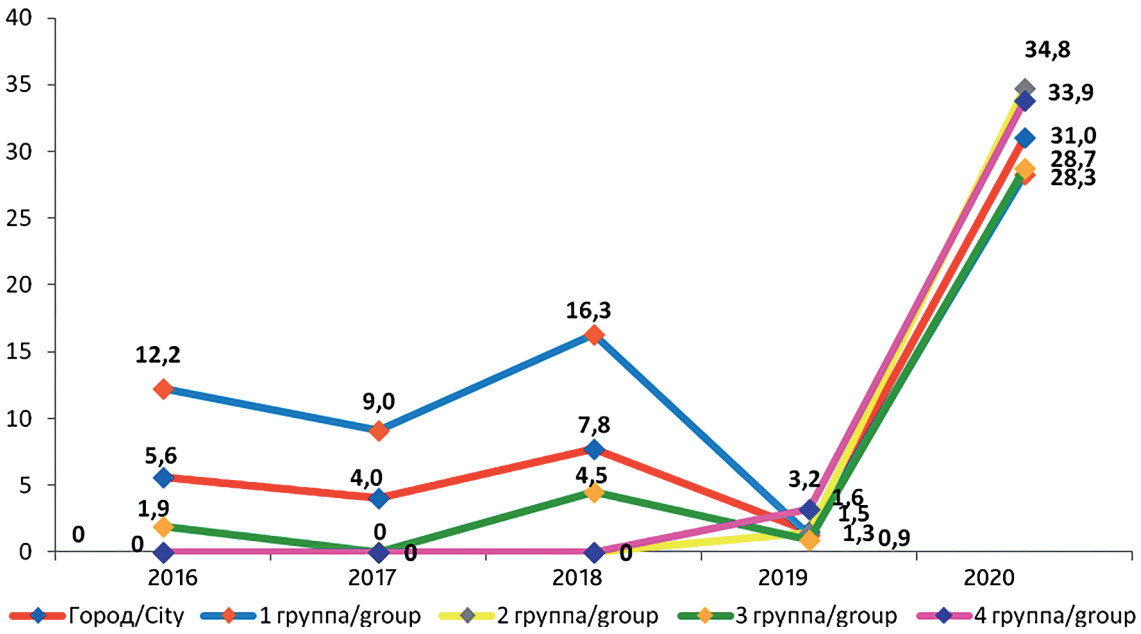

Fig. 7. Incidence of viral pneumonia in children 0–17 years old in 2016–2020 in St. Petersburg (per 100,000 children)

Рис. 7. Заболеваемость вирусной пневмонией детей 0–17 лет в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

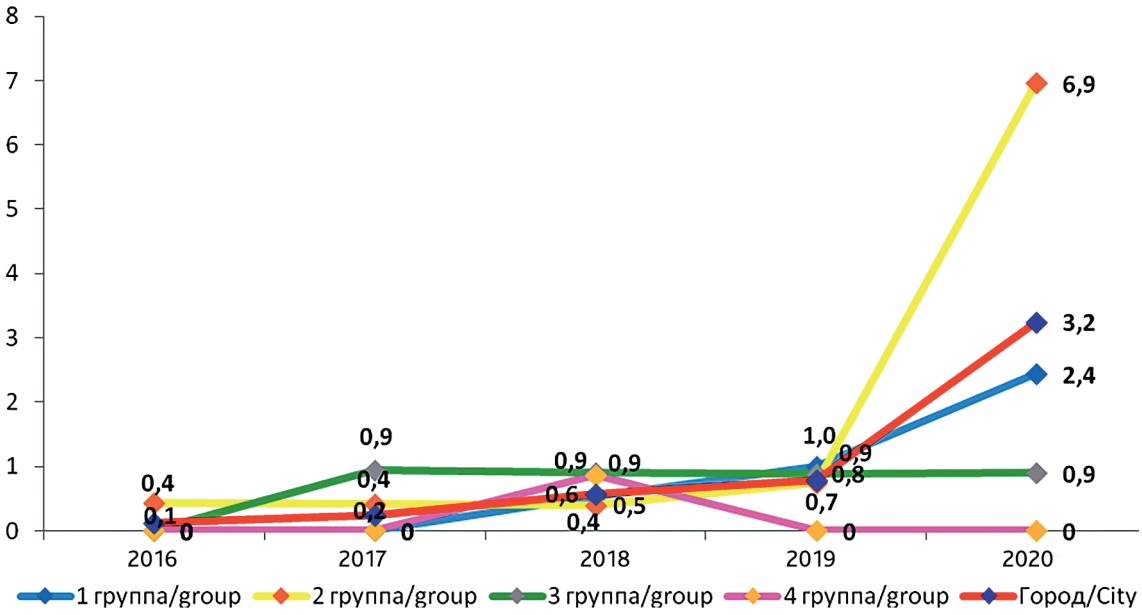

Fig. 8. Incidence of gonococcal infection in children aged 0–17 years in 2016–2020 in St. Petersburg (per 100,000 children)

Рис. 8. Заболеваемость гонококковой инфекцией детей 0–17 лет в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

(9 times) districts. It should be noted that gonococcal infection was not registered in suburban areas during the entire observation period (Fig. 8).

The age of 15–17 years accounted for 85% of all cases of registered gonococcal infection, while the age group of 7–14 years accounted for 10.2%. Possible reasons for the increase in the incidence of gonococcal infection may be such factors as lack of full-time employment in the educational process (distance learning), inability to attend additional educational, sports and cultural events, and decreased parental supervision (parents continued to work), which led to

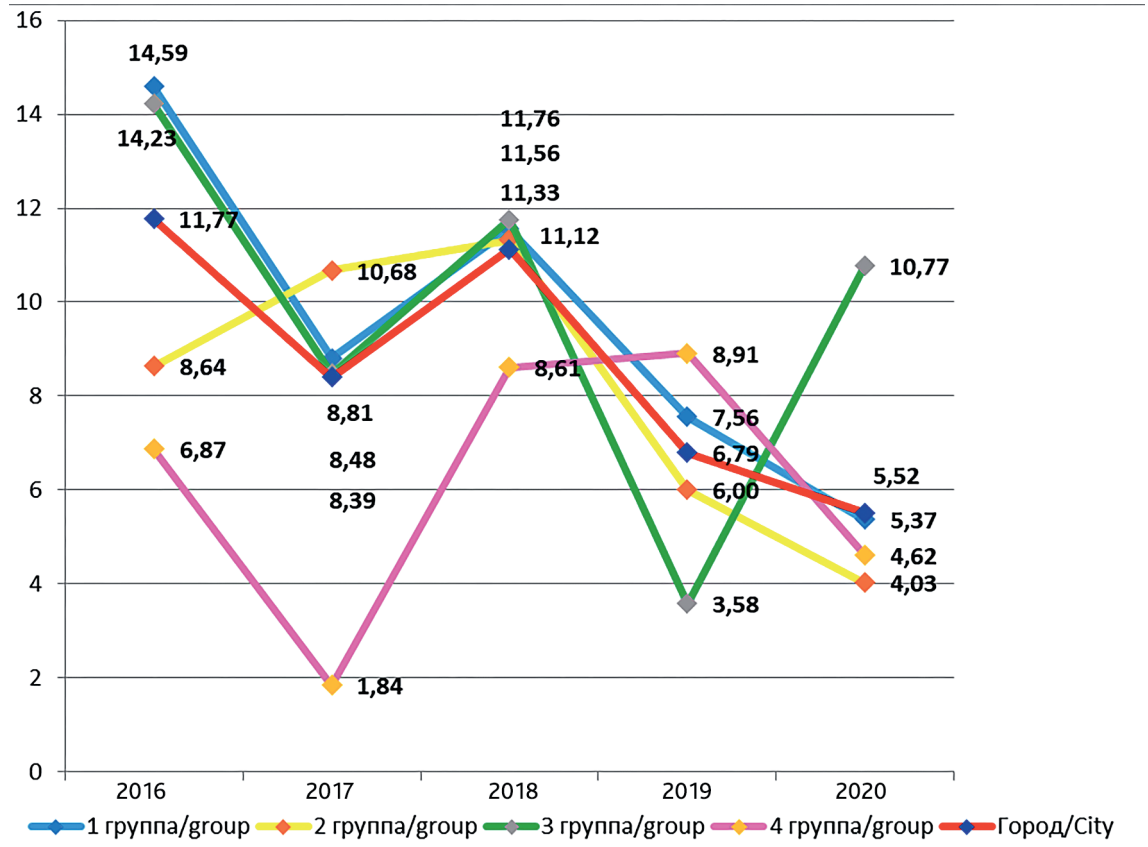

Fig. 9. Incidence of active tuberculosis in children aged 0–17 years in 2016–2020 in St. Petersburg (per 100,000 children)

Рис. 9. Заболеваемость активным туберкулезом детей 0–17 лет в 2016–2020 годах в Санкт-Петербурге (на 100 000 детей)

the emergence of uncontrolled free time among adolescents. Insufficient sexual and hygienic education of adolescents in families and educational organizations cannot be excluded.

Analyzing the incidence of active tuberculosis (TB) in children aged 0–17 years, there has been noted a wave-like course of the indicator both in the whole city and in the groups of districts with a tendency to decline. The highest rates of decline were recorded in dormitory (–63.3%) and industrial (–53.5%) districts. The decrease in the whole city amounted to 53.4%. The group of suburban areas showed a sharp rise (almost 5 times) in the incidence rate in 2018 and 2019, but by 2020 the rate fell below the city average. It occurred mainly due to the morbidity in Pushkinsky district, which is a part of the group. Migrants find this district attractive, therefore, the registered active tuberculosis may have imported nature. The incidence rate of active tuberculosis in the historical districts increased 3-fold in 2020 compared to 2019, up to 10.8 per 100,000 children aged 0–17 years. Although it did not reach the 2016 level (14.7 per 100,000 children), the central district has the highest incidence rate of active tuberculosis in children aged 0–17 years (2-times higher than the city rate) (Fig. 9).

Such a rise in morbidity in the central districts might be explained by the large number of shared apartments and low provision of living space (per 1 inhabitant) (Table 5).

Analysis of the average annual age structure of infectious morbidity has shown that children 1–2 years old and 3–6 years old with children 3–6 years old are more susceptible to intestinal infections (29.6%) than representatives from other age groups carrying intestinal infections. Among the most common infections are dysentery (33.8%) and respiratory tract infections (acute respiratory infections — 33.8%, influenza — 35.2%, viral pneumonia — 31.3%). Children in the age group 7–14 years are more likely to have dysentery (32.8%), acute viral hepatitis (36.6%), parasitic infections (64.0%), and tuberculosis (43.6%). Adolescents aged 15–17

have lower frequency of acute respiratory infections (7.4%), acute viral hepatitis (13.3%) and dysentery (13.6%), influenza is at the level of children under one year old (8.1%). However, adolescents are the leaders in the age structure of gonococcal infection incidence (84.8%) (see Table 7).

CONCLUSION

During the pandemic period total infectious morbidity in St. Petersburg tend to decrease to 39.2%, the nosological composition of the registered infectious morbidity preserved in children aged 0–17. At the same time, there was a significant increase in a number of individual nosologies: influenza (by 47.0%), viral pneumonia (by 20.7 times), and gonococcal infection (by 32.0%).

The state of infectious morbidity in the child population of the metropolis largely depends on the living conditions of families: environmental, hygienic, socio-demographic (housing), medical and organizational (state of primary health care) conditions:

1. Levels of infectious morbidity of the child population significantly differ depending on the medical-economic and medical-social characteristics of the districts of residence, with an increase in morbidity in some groups of districts and a significant decrease in others. The highest incidence of acute viral hepatitis was observed in industrial areas in 2017 and in suburban areas in 2018, since there was recorded the highest percentage of unsatisfactory bacteriological samples of soil and surface water. The leaders in the incidence of respiratory tract infections were dormitory areas with high population density, this rate was 1.2 times higher than in urban areas. In 2018–2019 the suburban areas showed a 5-fold rise in the incidence of tuberculosis due to the Pushkin district, which had an imported outbreak of active form of tuberculosis.

2. There have been revealed the peculiarities of infectious morbidity of children depending on their age. Children 3–6 years old are the most frequently affected by infectious diseases (36.4%), children 4–14 years old are in the second place (27.6%), children 1–2 years old are in the third place (20.0%), followed by children under 1 year old (8.8%) and adolescents 15–17 years old (7.2%). Moreover, children aged 3–6 years are leaders in morbidity in almost all nosological forms examined, except for acute viral hepatitis, parasitic infections, gonococcal infection and active tuberculosis. Among sexually transmitted infections, gonococcal infection in adolescents aged 15–17 years accounted for 85%.

3. Studying the peculiarities of infectious morbidity during the pandemic of a new coronavirus infection will make it possible to determine ways to optimize organizational and anti-epidemic measures in the work of medical organizations.

The solution of all of the above-mentioned problems will make it possible to improve the organization of primary health care during the pandemic as well as bring it to a proper level.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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Consent for publication. Written consent was obtained from the patient for publication of relevant medical information within the manuscript.

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Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

Информированное согласие на публикацию. Авторы получили письменное согласие пациентов на публикацию медицинских данных.

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INDICATORS OF THE QUALITY OF LIFE OF NEWBORNS

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ABSTRACT. Data on indicators of quality of life in the population of infants, especially the first month of life, are extremely limited. Population indicators of quality of life in newborns can be used for screening and early diagnosis of certain pathological conditions. The aim of the study was to analyze the quality of life of healthy newborns and children born sick and ill. A total of 379 newborns were included in the study: 183 (48.3%) children — the main group, 196 (51.7%) — the control group. The main group included newborns with various pathologies who arrived for inpatient treatment or consultative appointments in the process of dynamic observation, and the control group included healthy children. The quality of life was assessed using the PedsQL questionnaire. The indicators of the quality of life of sick newborns were found to be significantly lower than the corresponding indicators in healthy newborns. In sick children, physical activity, physical symptoms and social activity is reduced. When comparing the quality of life in newborns with different pathologies, the indicators of the quality of life of newborns with anemia were fixed to be higher than in children with congenital heart defects and hydrocephalus. And the quality of life of newborns with hydrocephalus is lower than that of children with heart defects. Significant differences in the quality of life of newborn children were established between 2 and 3 health groups. At the same time, the indicators of the quality of life of newborns of health groups 1 and 2 are similar.

KEY WORDS: quality of life; newborns; PedsQL questionnaire.

ПОКАЗАТЕЛИ КАЧЕСТВА ЖИЗНИ НОВОРОЖДЕННЫХ

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РЕЗЮМЕ. Данные о показателях качества жизни в популяции детей младенческого возраста, особенно первого месяца жизни, крайне ограничены. Популяционные показатели качества жизни у новорожденных детей могут быть использованы для скрининга и ранней

диагностики некоторых патологических состояний. Целью исследования был анализ качества жизни здоровых новорожденных и детей, родившихся больными и заболевших. Всего в исследование было включено 379 новорожденных: 183 (48,3%) ребенка — основная группа, 196 (51,7%) — контрольная группа. В основную группу включены новорожденные дети с различными патологиями, прибывшие на стационарное лечение или консультативный прием в процессе динамического наблюдения, а в контрольную — здоровые дети. Оценку качества жизни проводили с помощью опросника PedsQL. Установлено, что показатели качества жизни больных новорожденных существенно ниже соответствующих показателей у здоровых новорожденных. У больных детей снижена физическая активность, физические симптомы и социальная активность. При сравнении качества жизни у новорожденных с разной патологией показано, что показатели качества жизни новорожденных с анемией выше, чем у детей с врожденными пороками сердца и гидроцефалией, а показатели качества жизни новорожденных с гидроцефалией ниже, чем у детей с пороками сердца. Значимые различия по качеству жизни новорожденных детей установлены между 2-й и 3-й группами здоровья. В то же время показатели качества жизни новорожденных, имеющих 1-ю и 2-ю группы здоровья, сходны.

КЛЮЧЕВЫЕ СЛОВА: качество жизни; новорожденные; опросник PedsQL.

INTRODUCTION

One of the main tasks of public health in Russia is to create a system of formation, active preservation, restoration and strengthening of people's health [7, 12, 20]. The Russian Government Decree of December 26, 2017 approved the state program "Health Care Development". One of its main priority projects is "improving the organization of medical care for newborns and women during pregnancy and after childbirth, providing, among other things, the development of a network of perinatal centers in the Russian Federation" [15]. The special attention to the problems of preserving and strengthening children's health is confirmed by the Decree of the President of the Russian Federation No. 240 of May 29, 2017, according to which the years 2018–2027 were declared the "Decade of Childhood" in Russia [17]. Separately, it should be noted that one of the most important directions in modern pediatrics is the development of preventive measures to improve the health and quality of life of children [2, 5, 8]. In this regard, the issues of the quality of life of the pediatric population acquire special significance.

The relevance of the children's quality of life study is primarily determined by the need to improve the system for monitoring the health of the pediatric population as well as to take into account children's quality of life indicators in order to develop unified recommendations for their improvement [10, 14, 24]. Population indicators of children's quality of life in early childhood can be used for screening and early diagnosis of some pathological conditions, as well as for preventive and dispensary examinations, for the development of individual rehabilitation programs and assessment of their effectiveness .

According to the data of domestic and foreign studies, the number of quality of life researches in pediatrics is much less than in the adult population [6, 16, 22]. Data on quality of life indicators in infant population are extremely limited [9, 11, 13]. At the same time, there is a tendency for a constant increase in the number of publications, which indicates an undoubted interest in this problem [1, 3, 21, 23]. However, there are no data on comparative analysis of the quality of life of healthy newborns and children with different pathologies in the available literature, as well as data on determining the level of "optimal quality of life of a newborn" [4, 18, 19].

Thus, the study of normative indicators of the quality of life of newborns will allow us to identify patterns of changes in the quality of life during the development of pathologies, as well as to compare the level of quality of life in different regions of our country.

AIM

To analyze the quality of life of healthy newborns and children born or got ill.

MATERIALS AND METHODS

A total of 379 newborns were included in the research: 183 (48.3%) children — main group,

196 (51.7%) — control group. The main group included newborns with various pathologies who arrived for inpatient treatment or consultative appointment during dynamic observation, and the control group included healthy infants of the first month of life. Newborns were included in the research after the parents gave their consent to participate in the research and signed an informed consent form [3]. The study was conducted at the Department of Pathology of Newborns and Premature Infants of St. Nicholas Miracle Worker Hospital No. 17 and the Perinatal Center of the Federal State Budgetary Educational Institution of Higher Education St. Petersburg State Pediatric Medical University of the Ministry of Health of Russia. The quality of life was assessed using the parental form of the PedsQL questionnaire for children from 0 to 1 year of age, adapted for newborns [2, 6, 14]. The PedsQL questionnaire is a general tool for studying quality of life and can be used both in children with diseases as well as in healthy children. Adapted for newborns, the parental form of the PedsQL questionnaire for children from 0 to 1 year of age included 36 questions, the results of which were used to form 5 assessment scales: physical activity (PA), physical symptoms (PS), emotional state (ES), social activity (SA), and cognitive activity (PA). The standardized response options for the questions were compiled for scoring using the rating summation method and presented as Likert scales. After scaling, results were expressed as scores from 0 to 100: the higher the total, the better the child's quality of life was.

Descriptive statistics data were presented as number of observations, arithmetic mean, standard deviation and percentages. Choosing the criterion for testing the statistical significance of differences between the analyzed indicators, it was based on the character of data distribution. The normality of the distribution of the analyzed statistical samples was checked using the Kolmogorov-Smirnov criterion. When comparing two groups we used Student's t-criterion or its nonparametric analog — Mann-Whitney rank criterion. Frequency analysis was performed using Pearson's chi-square. The significance level was set as $p < 0.05$.

Statistical processing of the results and data analysis were performed using Microsoft Office Excel computer program and statistical analysis software package developed by StatSoft, STATISTICA 10.0.

RESULTS AND DISCUSSION

The research of newborns' quality of life indicators was conducted in two stages. At the first stage, quality of life indicators were studied in the group of newborns without pathologies and in the group of newborns with pathologies. At the second stage, the quality of life indicators in newborns with different pathologies were compared.

The research showed that the quality of life indicators for all PedQL scales were lower in infants born or got ill compared to healthy children in the control group. Significant differences were found for the scales "physical activity", "physical symptoms", "emotional state", "social activity", "cognitive activity", "total score of physical functioning", "total score of psychosocial health", and "total score". Figure 1 shows mean quality of life scores according to the PedsQL questionnaire in children born or got ill (main group) and healthy newborns (control group).

Statistically significant differences were obtained for the scales "physical activity", "physical symptoms", and "social activity" between the groups (paired Student's t-test), $p < 0.05$. Significant differences were also revealed on the total physical functioning and psychosocial health scores as well as on the total quality of life score between groups (paired Student's t-test), $p < 0.05$. Thus, newborns born or got ill were more frequently affected by impaired physical functioning, physical symptoms, and social activity. It should be noted that the presence of pathological conditions and diseases in newborns has a negative impact on all spheres of their lives. These differences are clearly visible on the profiles of the quality of life of infants born or got ill and diseased and in the control group (Fig. 2).

The results obtained are similar to the data provided by the research of N.I. Kulakova et al. whose aim was to analyze the quality of life of children born in critical condition in the first month of life [11]. Forty-seven infants were examined and divided into 2 groups: 1) healthy newborns; 2) infants in critical condition. The authors of this research found that infants born in critical condition had a lower level of quality of life compared to healthy newborns due to a decrease in the parameters of all levels of functioning.

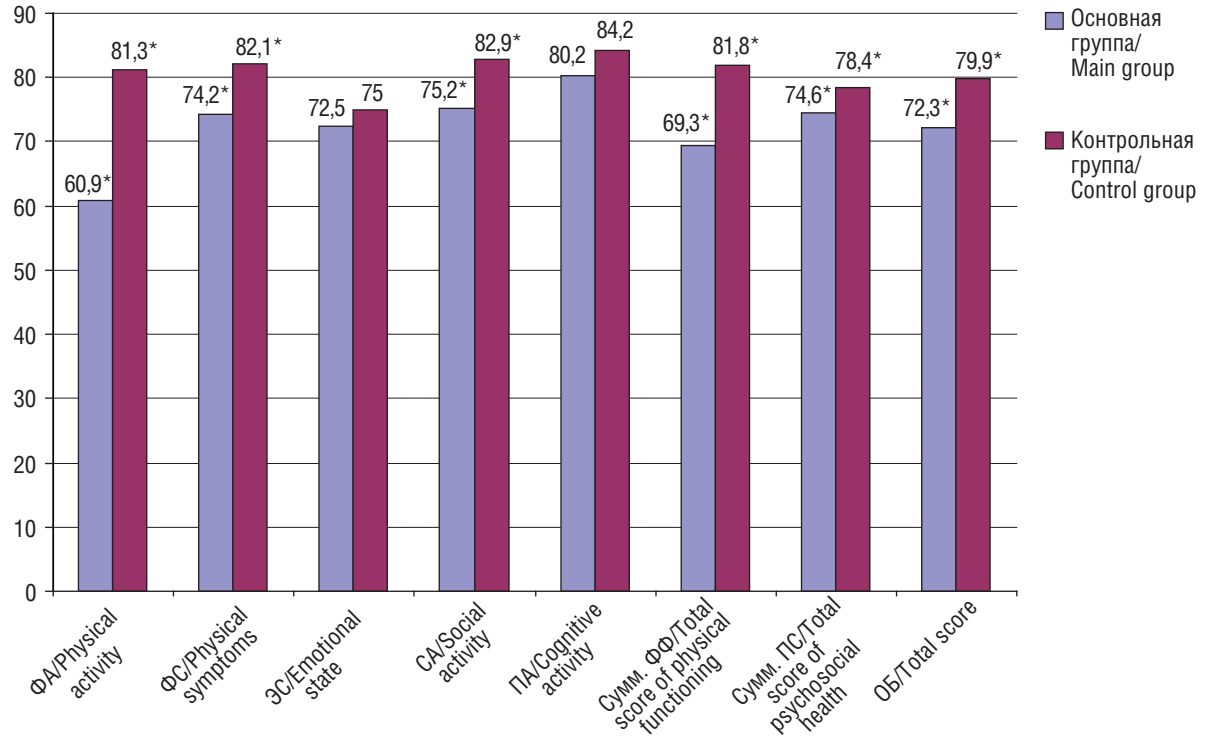

Fig. 1. Average values of the quality of life of healthy newborns and children born sick and became ill

Рис. 1. Средние значения качества жизни здоровых новорожденных и детей, родившихся больными и заболевших

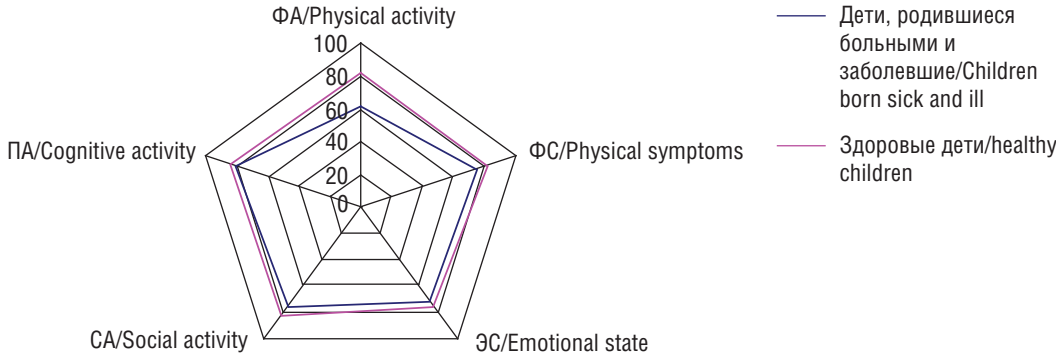

Fig. 2. Profiles of the quality of life of healthy newborns and children born sick and fallen ill. PA — cognitive activity; SA — social activity; FA — physical activity; FS — physical symptoms; ES — emotional state

Рис. 2. Профили качества жизни здоровых новорожденных и детей, родившихся больными и заболевших. ПА — познавательная активность; СА — социальная активность; ФА — физическая активность; ФС — физические симптомы; ЭС — эмоциональное состояние

Figures 3, 4 and 5 show the quality of life indicators in infants with different pathological conditions and diseases: anemia, heart defect, hydrocephalus. A comparative analysis of quality of life indicators in newborns was carried out: 1) newborns with congenital heart defects and children with anemia; 2) children with congenital heart defects and children with hydrocephalus; 3) children with hydrocephalus and children with anemia.

Figure 3 shows that all quality of life indicators are higher in children with anemia than in newborns with congenital heart disease. However, the identified differences in quality of life indicators are statistically significant only on the scales of physical activity, physical health, and total score.

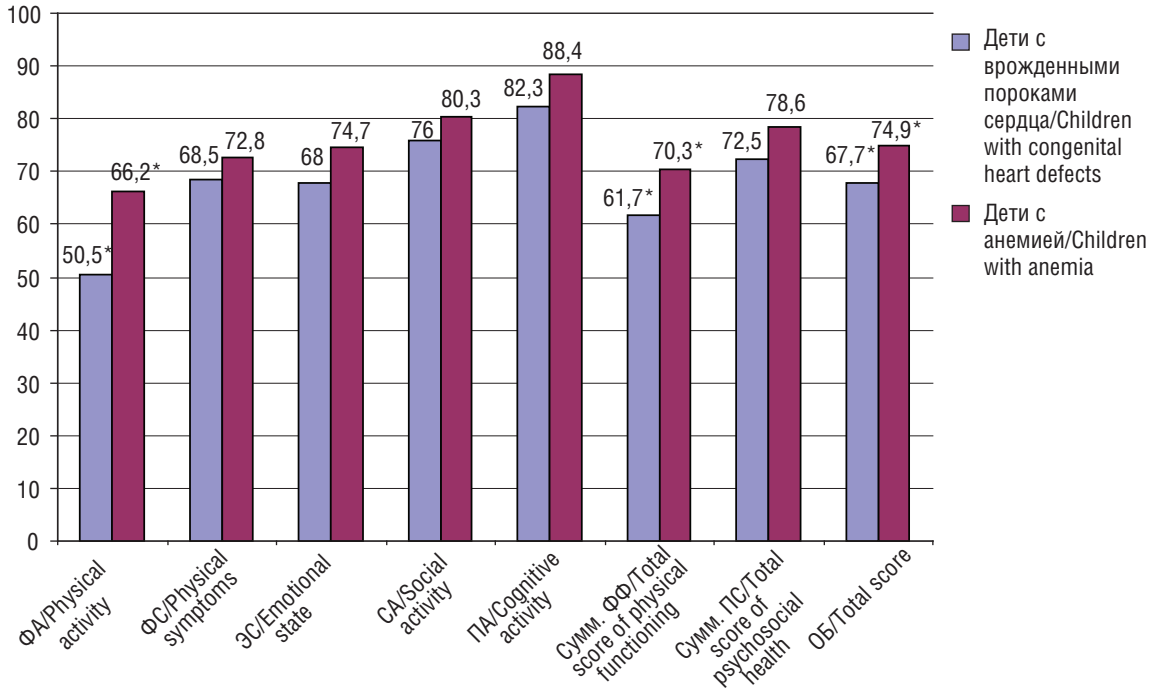

Fig. 3. Comparison of quality of life indicators in the main group of children with congenital heart defects and in children with anemia

Рис. 3. Сравнение показателей качества жизни в основной группе у детей с врожденными пороками сердца и у детей с анемией

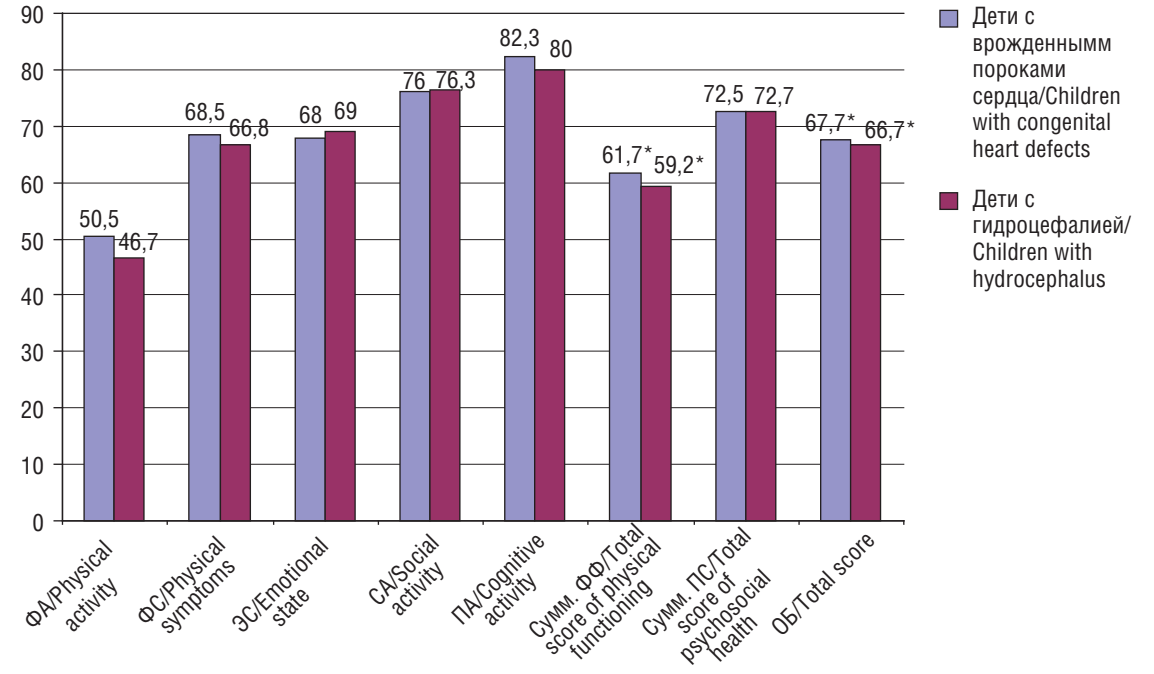

Fig. 4. Comparison of quality of life indicators in the main group of children with congenital heart defects and in children with hydrocephalus

Рис. 4. Сравнение показателей качества жизни в основной группе у детей с врожденными пороками сердца и у детей с гидроцефалией

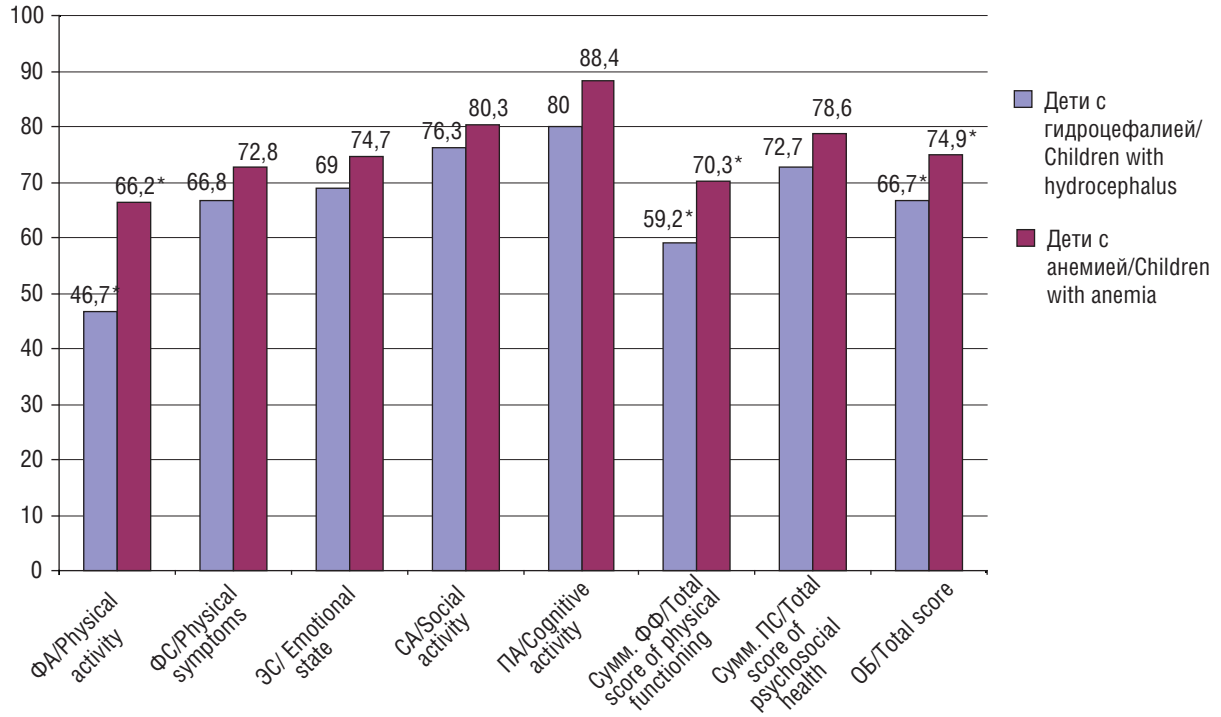

Fig. 5. Comparison of quality of life indicators in the main group of children in children with anemia and in children with hydrocephalus

Рис. 5. Сравнение показателей качества жизни в основной группе у детей с анемией и у детей с гидроцефалией

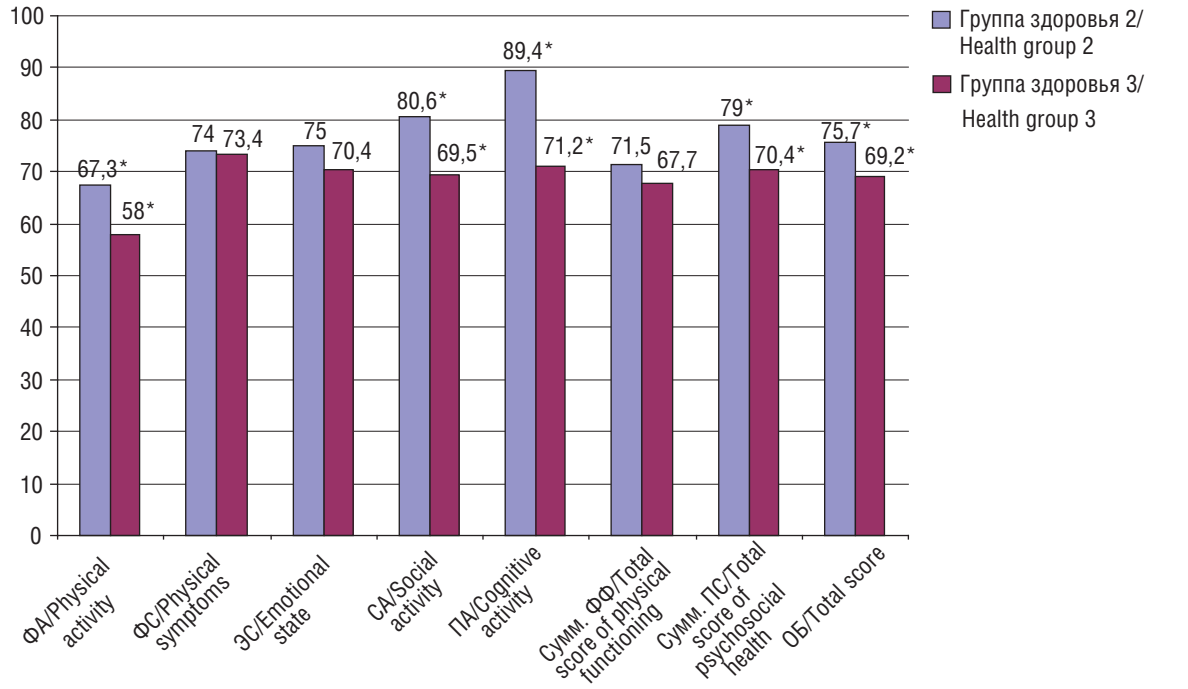

Fig. 6. Average indicators of quality of life in newborns in the main group, depending on the health group

Рис. 6. Средние показатели качества жизни у новорожденных в зависимости от группы здоровья в основной группе

Comparison of quality of life indicators in newborns with congenital heart disease and hydrocephalus showed that almost all indicators are higher in newborns with cardiac pathology, except for emotional state, social activity, and psychosocial health (Fig. 4). The revealed differences in quality of life indicators are statistically significant on the scales of total physical functioning score and total score.

Comparison of quality of life indicators in newborns with anemia and hydrocephalus revealed that all quality of life indicators were higher in infants with anemia (Fig. 5). The identified differences in quality of life indicators were statistically significant on the scales of physical activity, physical functioning and total score.

The research also examined the quality of life indicators in the main and control group in relation to the health groups (Fig. 6, 7). It appeared that the quality of life indicators in the main group differed in newborns with different health groups. Significant differences were found on the scales of physical activity, social activity, cognitive activity, psychosocial health, and total quality of life score. At the same time, no significant differences in the quality of life according to health groups were found among healthy newborns (Figs. 8, 9).

Thus, significant differences in the quality of life of newborns were found between the 2nd and 3rd health groups. The quality of life indicators of newborns with the 1st and 2nd health groups were similar. Moreover, parents rated the quality of life of newborns with health group 3 lower than children who had health group 1.

The results obtained confirm the data of the Scientific Center for Children's Health of the Ministry of Health of the Russian Federation. The data include quality of life indicators for children of different age groups, including infancy, early childhood and preschool age [7]. The QUALIN questionnaire was used to evaluate the condition of infants and toddlers. It was filled in by one of the parents (mother) and a pediatrician observing a child. The research included 158 infants (3 months to 1 year of age, 58.2% boys) and 178 toddlers aged 1 to 2 years (55.3% boys) [3]. Studying the way a health status influences children's quality of life, it was found that children with health groups 2 and 3 had significantly lower scores on the scales "behavior and communication", "family environment and neuropsychological development" and "physical health" as well as the total score of the questionnaire in both age groups compared to healthy children. At the same

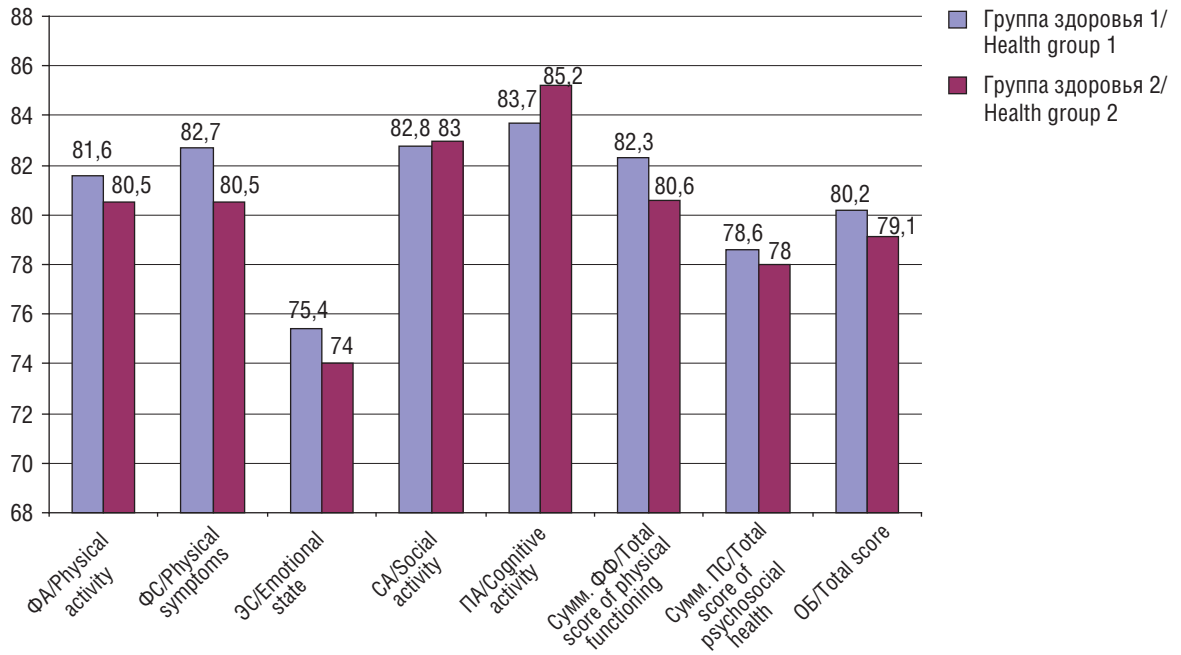

Fig. 7. Average indicators of quality of life in newborns of comparison group, depending on the health group

Рис. 7. Средние показатели качества жизни у новорожденных в зависимости от группы здоровья в группе сравнения

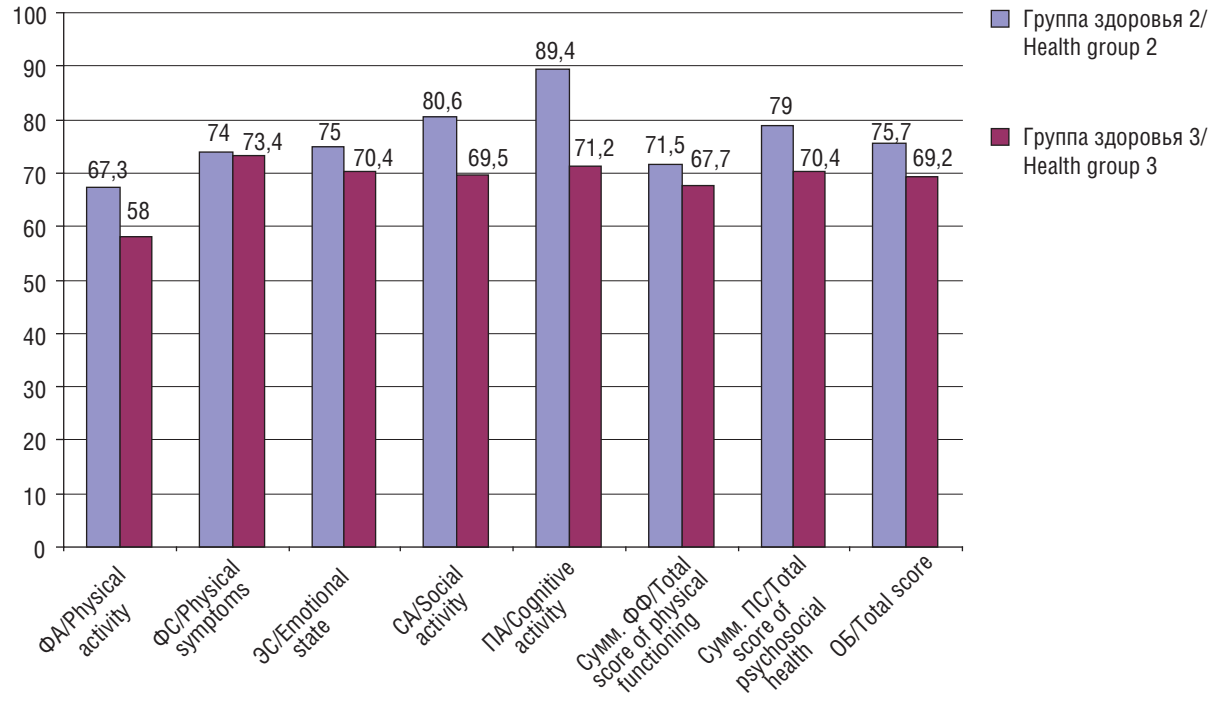

Fig. 8. Comparison of indicators of quality of life by health groups in the main group of newborns

Рис. 8. Сравнение показателей качества жизни у новорожденных по группам здоровья в основной группе

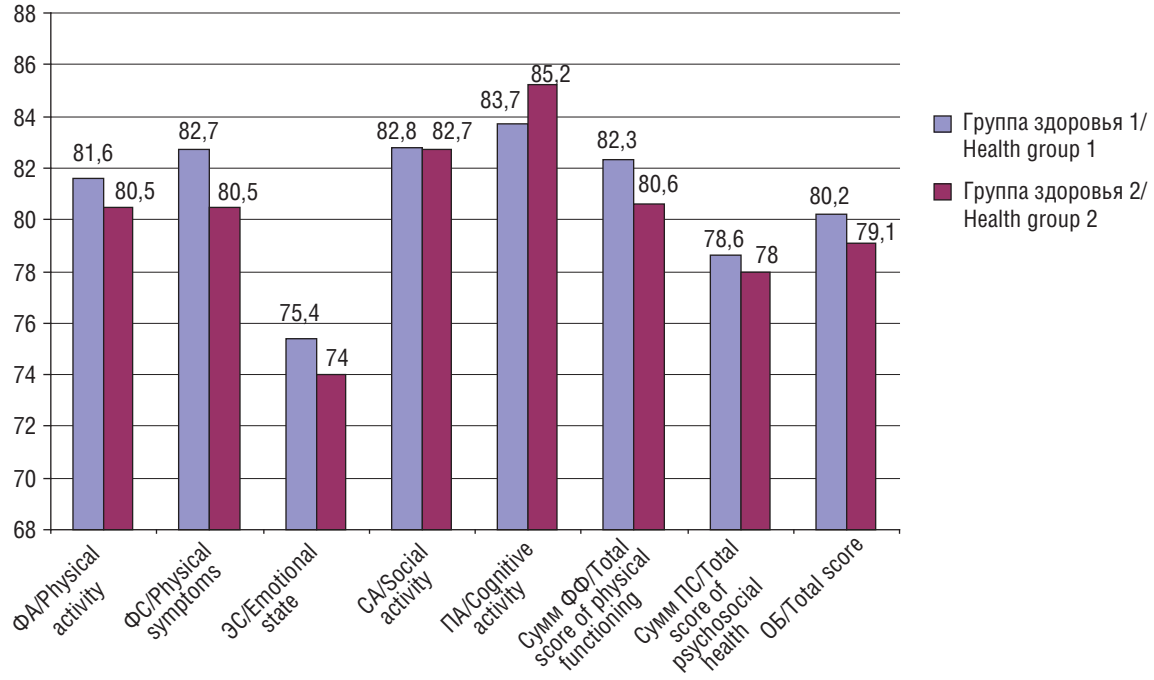

Fig. 9. Comparison of indicators of quality of life in newborns by health groups in the comparison group

Рис. 9. Сравнение показателей качества жизни у новорожденных по группам здоровья в группе сравнения

time, in the group of infants with various health disorders, doctors rated all aspects of children's quality of life lower than parents. The group of children aged 1–2 years was also assessed with lower scores on the scales "behavior and communication", "family environment" and the total score of the questionnaire by doctors; there was no disagreement in the assessment of the quality of life between parents and pediatricians in the group of healthy children.

CONCLUSION

It was established that the quality of life of healthy newborns is significantly better QoL of children born or got ill. Quality of life indicators in ill newborns are significantly lower than the corresponding indicators in healthy newborns. The ill infants have reduced physical activity, physical symptoms and social activity. When comparing the quality of life in newborns with different pathologies, it is shown that the quality of life indicators of newborns with anemia are higher than those of children with congenital heart disease and hydrocephalus. Quality of life indicators in newborns with hydrocephalus are lower than in children with cardiac pathologies.

Significant differences in the quality of life of newborns are established between the 2nd and 3rd health groups. The quality of life indicators of newborns with the 1st and 2nd health groups are similar.

The results of the research show that determination of newborns' quality of life is an additional criterion for evaluating the health status of children. Its assessment and prediction allow to identify newborns with low, medium and high quality of life, which, in turn, enables to carry out preventive measures to improve the health of expectant mothers and newborns. The quality of life of a newborn can be considered as an integral characteristic of the health status of this contingent of children.

It is advisable to use data on violations of the quality of life of newborns to develop targeted measures for children and their parents during the neonatal period.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

Competing interests. The authors declare that they have no competing interests.

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Consent for publication. Written consent was obtained from the patient for publication of relevant medical information within the manuscript.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

Информированное согласие на публикацию. Авторы получили письменное согласие пациентов на публикацию медицинских данных.

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VALUE-BASED APPROACH TO ROAD MAP OF MODERNIZATION OF THE ONCOLOGICAL CARE

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ABSTRACT. The value-based concept in healthcare was introduced by M. Porter in 2004 as an approach for improving the quality of medical care. The existing practice of implementing this approach in Russia and abroad by the present time has been limited by single projects and tools, while comprehensive methodology adapted to Russian oncological care isn't created. The article presents a roadmap for implementation of value-based projects in oncology developed and based on the author's experience. The analysis of Russian and foreign literature, standards, methods on the research topic was carried out. Project management tools and road mapping techniques are used. Processes decomposition, scenario and intermediate results were determined to achieve the goal — a value-oriented oncological care. The roadmap includes seven consecutive steps — setting up the integrated practice units in the form of centers of excellence, the multidisciplinary teams education, mapping the patient's pathways, implementation into routine practice the patient-reported outcome measures (PROMs) and patient-relevant experience measures (PREMs), shared decision-making, and development of patient support programs. The necessary measures to support stakeholders for each stage of implementation are formulated. The present study is theoretical, representing the result of the analysis of the author's previous experience and the synthesis of existing approaches. Since the roadmap has a long life cycle, the content of the stages may change during operation. The implementation of the approach requires reforming the healthcare system with a change in financing methods, approaches to cancer care, and the creation of rational incentives for all stakeholders. For replication a benchmarking platform and a flexible digital infrastructure with the ability to monitor the costs and results of medical care at the individual patient's level must be formed.

KEY WORDS: value-based healthcare; patient-oriented approach; patient adherence; quality of life; shared decision making; patient pathway; oncology care.

ДОРОЖНАЯ КАРТА МОДЕРНИЗАЦИИ ОНКОЛОГИЧЕСКОЙ СЛУЖБЫ НА ОСНОВЕ ЦЕННОСТНО-ОРИЕНТИРОВАННОГО ПОДХОДА

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РЕЗЮМЕ. Идея ценностно-ориентированного подхода в здравоохранении была предложена M. Porter в 2004 г. в качестве средства повышения качества медицинской помощи. Существующая практика реализации подхода в России и за рубежом до настоящего времени ограничена внедрением лишь отдельных инструментов, тогда как всеобъемлющая методология, адаптированная к российской онкологической практике, отсутствует. В статье представлена разработанная на основании опыта автора дорожная карта реализации проектов ценностно-ориентированного подхода в онкологии. Был проведен анализ российской и зарубежной литературы, стандартов, методик по теме исследования. С помощью методов проектного менеджмента и дорожного картирования была произведена декомпозиция работ, определены промежуточные результаты, разработан сценарий достижения цели — ценностно-ориентированной онкологической службы. Дорожная карта включает семь последовательных этапов — создание центров компетенций интегрированного оказания медицинской помощи, формирование и обучение мультидисциплинарных команд, картирование пути пациента, внедрение оценок пациентских показателей исхода (PROMs) и опыта пациента (PREMs), совместное принятие решения о лечении, разработка программ поддержки пациентов. Сформулированы необходимые меры поддержки стейкхолдеров для каждого этапа внедрения. Настоящее исследование является теоретическим, представляя собой результат анализа предыдущего опыта автора и синтеза имеющихся подходов. Поскольку дорожная карта имеет длительный жизненный цикл, в процессе работы содержание этапов может меняться и корректироваться. Реализация подхода требует переформатирования системы здравоохранения со сменой методов финансирования, подходов к оказанию онкологической помощи, создания рациональных стимулов для ее участников. Для тиражирования необходимо наличие платформы для бенчмаркинга и гибкой цифровой инфраструктуры с возможностью мониторинга затрат и результатов оказания медицинской помощи на индивидуальном уровне.

КЛЮЧЕВЫЕ СЛОВА: ценностно-ориентированное здравоохранение; пациентоориентированность; приверженность пациента; качество жизни; совместное принятие решения о лечении; путь пациента; онкологическая служба.

A distinctive feature of modern healthcare is its high technology and innovation. However, with the advent of innovative, expensive technologies, healthcare costs are increasing. The aging population and the growing proportion of chronic diseases also lead to increased costs, which may hinder the achievement of target indicators. The issues of increasing the efficiency of the healthcare system are extremely acute throughout the world, and Russia is no exception [32].

Changes in methods of payment for medical services partially solve this problem. Thus, in recent years, the Russian Federation has undertaken considerable work to shift from the "payment per service" and "per capita financing" models to clinical and statistical groups (CRGs). It is obvious that payment should be linked not to the quantity, but to the quality of medical care — namelly to the value received as a result of treatment. At the same time, a patient himself should formulate the value of treatment since he is the object of therapeutic manipulations. These approaches are the basis of a relatively new concept for Russian medicine — value-based health care.

The basis of the value-based approach in healthcare (VBA) is the transformation of medical care "from measuring the volume and processes of medical care to controlling the final results that are important for patients" [26, 27]. The goal of a value-based approach is to maximize "value," defined as the ratio of outcomes "important to patients" to the cost of achieving them [3, 10].

Despite the fact that the idea of VBA was first mentioned by M. Porter in 2004 [26] after 10 years of research devoted to analyzing the health care industry from the perspective of competition, there is no algorithm for its practical implementation. The term "value" often refers to "humanistic principles" or to a concept for "cost reduction" [22].

Separate attempts to create a methodology for VBA were implemented within the framework of the EIT Health project [22]. In addition, a wide variety of organizations develop and apply standardized toolkits (sets, checklists) in order to accomplish individual VBA tools. One

such organization involved in standardizing Patient-reported outcome measures (PROMs) is the non-profit organization International Consortium of Health Outcomes (ICHOMB) [28]. Nevertheless, a comprehensive methodology for the implementation of PROMs, especially adapted to Russian oncologic practice, is currently lacking, which determines the importance of the present research [10].

In June 2022, the Agency for Strategic Initiatives (ASI) established the Coordination Council for the Development of the Healthcare System of the Russian Federation (CC NSSS (non-state security sphere) of the RF). The main focus of the CC NSSS RF is to search for opportunities to cooperate between civil society, non-profit organizations and entrepreneurs with legislative and executive authorities at different levels and in various formats. As part of the work of the CC NSSS RF, the project "Modernization of Oncology Service on the Principles of Value-Based Approach" was selected as a backbone project. It was recommended for further support by the authorities. To support the implementation of the Project, the website www.VBHC.ru is functioning.

AIM

To develop a roadmap for the implementation of value-based approach projects in oncology.

MATERIALS AND METHODS

Russian and foreign literature, standards, and methods of the value-based approach were analyzed. Based on the synthesis of information, foreign practices of the value-oriented approach, and the author's previous experience of implementation, the main parameters and provisions were formulated [2–8]. The structure of the roadmap is based on the methodologies of project management and road mapping. The work was decomposed, intermediate results were defined, and a scenario was developed to achieve the goal of implementing the full cycle of value-based approach projects.

RESULTS

Based on the results of the pilot projects of the value-based approach, a roadmap with seven consecutive stages of implementation was drawn up.

1. Implementation of an integrated system of specialized oncological care through the designation of centers of competence

At the first stage, it is necessary to reform the existing approach to the provision of medical care by creating centers of competence (CCs) (Integrated practice units (IPUs) for the most common or socially important nosologies. Separation of CCs into divided structural units allows not only to focus efforts on achieving target indicators, but also to visualize processes and facilitate comparison between different organizations and regions [22].

According to the data of the P.A. Herzen Moscow Research Institute of Oncology, in 2020 there were following leading localizations in the overall (both sexes) structure of cancer morbidity in the Russian Federation: Breast (11.8%), skin (except melanoma) (10.9%), trachea, bronchus, lung (9.8%), colon (7.2%), prostate (6.9%), stomach (5.8%), rectum, rectosigmoid junction, anus (5.1%), lymphatic and hematopoietic tissue (5.0%), uterine body (4.3%), kidney (3.8%), pancreas (3.4%), cervix (2.8%), bladder (2.8%), and ovary (2.4%) [9]. Priority nosologies were identified to form eight CCs with subsequent replication to other nosologies, in accordance with the frequency of oncologic morbidity, as well as with expert assessments. Such CCs are multidisciplinary teams, which are ideally physically located in one medical organization. The main task of multidisciplinary teams is to "fully and comprehensively meet the needs of well-defined groups of patients throughout the entire cycle of medical care" [22]. The creation of CCs implies profound organizational changes in order to provide better, patient-centered and efficient medical care with a shorter cycle.

An integrated approach to patient care also implies the use of multimodal methods of diagnosis and treatment. Multidisciplinarity is "an opportunity to improve the quality of medical care for patients on the basis of multilevel and integrated use of the potential of doctors of different profiles and specialists, whose successful cooperation leads to the introduction of organizational, informational, therapeutic innovations" [20].

Previous results of the implementation of multidisciplinary approach in oncodermatologic practice indicate an increase in the detection of skin cancer, increased patient adherence to treatment and dispensary follow-up, and increased patient satisfaction with the quality of services [4].

Implementation of this stage is difficult since the structure of such multidisciplinary teams disrupts the traditional practice of clinical work at the specialty level: it changes approaches to the distribution of authority and cash flow, requires serious changes in staffing and remuneration system [10].

2. Formation of multidisciplinary teams on the basis of centers of competence

In Russia, the multidisciplinary approach to treatment is enshrined in the procedures for the provision of medical care in the relevant profile. Thus, the multidisciplinary approach to the treatment of oncological diseases is defined by the Order of the Ministry of Health of the Russian Federation No. 116n dated February 19, 2021 "On Approval of the Procedure for the Provision of Medical Care to Adults with Oncological Diseases" [11]. Nevertheless, the creation of multidisciplinary teams (MDTs) as a separate organizational structure differs from the multidisciplinary approach since it eliminates formalism, and also provides an opportunity to monitor their effectiveness and motivation by including indicators (key performance indicators, KPI) in the effective contract [12].

In 2009, The National Cancer Action Team (NCAT) studied and standardized the rules of functioning of multidisciplinary teams [24]. To date, these standards are the most widely recognized and accessible guidelines for multidisciplinary practice. Later on, these standards were supplemented and adapted, and special checklists were created. Most of the listed tools include assessment of such basic characteristics as team requirements, infrastructure, organization of the discussion process, patient-centeredness of the clinical decision and team management.

The implementation of an integrated system of specialized cancer care is becoming more common as it is a logical consequence of advances in medicine. The implementation of an integrated approach to the provision of medical care can prevent duplication of medical functions and increase the efficiency of health care resources [15, 20, 25]. Thus, the previously implemented project on the organization of a multidisciplinary team confirmed its effectiveness: doctors began to base their clinical decisions more often on evidence, to comply with clinical recommendations, to focus in their practice not only on clinical results, but also on the psycho-emotional and social needs of the patient [5].

3. Mapping the "patient pathway" on the basis of simulation modeling

The transformation of modern healthcare towards patients' values dictates new requirements to the quality and availability of medical care. Mapping of the "cancer patient's path" based on patients' values allows to identify "bottlenecks" of routing and to predict possible risks of low patient adherence to treatment related to the availability of medical care. For instance, the external and internal routing of skin cancer patients was restructured as a result of patient pathway mapping, which allowed to reduce the time from the beginning of the first treatment to discharge by 9 days in the case of surgical treatment and by 6 days in the case of radiotherapy treatment [3, 4].

The problem of treatment adherence is one of the most significant for modern medicine and society [31]. The research of the types of patients' behavior during the process of choosing a medical institution, attending physician, and treatment method has been called "patient pathway research" [16]. The "patient pathway" map allows describing and predicting the possible risks of "losing" patients at each stage of seeking medical help. Transparency of the patient's journey at all stages of the treatment and diagnostic process, as well as understanding the reasons for his/her refusal of treatment at any stages allows health care authorities to improve the process of providing medical services. The world's leading agencies are developing methodologies for analyzing the "patient pathway" to better understand the relationship between seeking medical care and the availability of medical services [22, 31]. Cancer patient monitoring systems designed for comprehensive informatization of oncological service are already successfully functioning in a number of Russian

regions [1]. They allow comprehensive monitoring of the oncologic situation in the region, manage patient flows by creating an operational digital picture of the oncologic situation.

Patient routing is a key organizational technology in ensuring the quality and availability of medical care. The use of simulation modeling methods allows describing and predicting the possible risks of routing [3].

New models of medical care organization should be built on the basis of a prototype [31]. Simulation modeling is an innovative paradigm. It has become a widespread tool in logistics, management and strategic planning, allowing to solve multicriteria optimization problems of large dimensionality.

4. Evaluation of patient-reported outcomes (PROMs)

A key aspect of value-based approach is the identification of patient-relevant outcomes. Data received from patients refer to patient-reported outcome measures (PROMs). The most commonly used PROM questionnaires assess:

- symptoms (impairment) and other aspects of well-being;
- functioning (disability);
- health status and the patient's perception of health;
- quality of life (QoL);
- health-related quality of life (HRQoL).

Health-related quality of life assessment tools are typically multidimensional questionnaires that assess a combination of impairment and/or disability dimensions and reflect a patient's health status. In contrast, QoL questionnaires go beyond impairments and disabilities, exploring the patient's ability to meet their needs as well as the patient's emotional response to their limitations. Questionnaires can be universal for all diseases (e.g., EQ-5D, SF-36, HUI) or specific, i.e., designed to assess treatment for specific cancers [10, 22].

Evaluation of patient-reported outcome measures, as experience has shown [4, 7], allows a physician to identify the patient's individual values and needs in relation to the conducted therapy and to take them into account when a physician makes corresponding treatment decisions. This approach ultimately improves patient satisfaction with the quality of medical care in general and with the chosen method of treatment in particular. Thus, considering patient-associated factors improved individual patient experience (50–100 Rush scores) [4].

Digitized questionnaires — ePROMs — are becoming increasingly common [22]. As part of the strategy of implementing a single digital circuit in healthcare, ePROMs can be implemented in the form of an additional SEMD (structured electronic medical document) containing specific ePROMs for selected oncologic nosologies. The questionnaires are filled out by medical staff using the patient's words, and the data are entered into the MIS (medical information system) with subsequent uploading to the regional VIMIS (vertically integrated medical information system) and the possibility of integration with federal VIMIS services for data verification and interregional sub-sectoral benchmarking. The use of questionnaires and their validated translations, strictly validated for a specific nosology became an important element of data unification for further comparison.

5. Shared treatment decision making

Patient-reported outcome data (PROMs) should be used as a guide to make joint treatment choices with a patient [4]. The formalization of shared treatment decision making as an approach occurred in the late 1990s as a result of the work of family medicine theorists Alvin and Edwards [17–19, 23]. They developed and proposed criteria that were subsequently included in the UK in a mandatory list of indicators of a treatment quality.

Currently, there are different models of communication with the patient — the OPTION model [17], the ecological model [30], the Treetalk Model [18], IP-SDM [22], VALS and laddering techniques are also used [7].

Several researchers in this field have developed scales to measure the extent to which the patient is involved in the decision-making process. The purpose of these scales is to examine what happens in shared decision making and to what extent a physician can encourage a patient to become an active participant in the choice of treatment. Based on these scales, tools are being developed to help physicians better understand patient needs. SURE rapid questionnaire is one of such validated tools [21].

An earlier research [4] showed the applicability of this concept in Russian industry prac-

tice. Thus, the research showed that younger age (r=–=0.398, p=0.009) and female gender (r=–0.475, p=0.001) are factors associated with higher emotional distress about appearance, which needs to be taken into account when choosing therapy [4]. Older patients were less involved in treatment choice (r=–0.633, p=0.001) [4]. The use of a patient-centered communication algorithm achieves satisfactory engagement (≥3 points out of 4) in 67% of patients [4].

6. Measuring patient experience

Patient-relevant experience measures (PREMs) also include data on patient perceptions of the treatment process. Unlike PROMs, PREMs are of non-medical nature, they aim to assess the quality of service delivery. Patient-relevant experience measures do not require strict validation of questionnaires and can be adapted to the aim of the research. According to the Federal Law No. 256-FZ of July 21, 2014 "On Amendments to Certain Legislative Acts of the Russian Federation on the Issues of Independent Assessment of the Quality of Service Delivery by Organizations in the Sphere of Culture, Social Services, Health Care and Education", all medical institutions "participating in the implementation of the program of state guarantees of free medical care for citizens are obliged to conduct an independent assessment of the quality of service delivery" [14]. In accordance with the Order of the Ministry of Health of the Russian Federation of July 13, 2018, No. 442 "On the organization of work to provide a technical possibility for patients to express their opinions about the quality of conditions of service provision by medical organizations on the official website of the Ministry of Health of the Russian Federation in the Internet», such an assessment is possible in the electronic form as well [13]. The main criteria for such an assessment include "openness and accessibility of information about the medical organization, comfort of service conditions and their availability, waiting time, friendliness, politeness, and competence of employees". There are also various numerical options for evaluating patient experience [2].

7. Development of patient support programs

The final stage of a value-based approach is development of patient support programs (PSP) to increase patient adherence to treatment and follow-up. PSP is a system of patient support throughout the patient's path from diagnosis and prescription of therapy to its completion or certain outcome in order to improve and preserve the patient's quality of life [29, 31].

The main goals of PSP implementation include: increasing patients' awareness of the disease; increasing adherence to treatment; and building disease management skills. The results of researches demonstrate the positive impact of PSP on the adherence of patients with chronic diseases, clinical outcome indicators in such patients, as well as their psychological state [29]. The aggregated Russian experience of program implementation has shown its direct impact on reducing healthcare costs, improving the quality of medical care, and patient adherence [8]. Patient support programs, implemented with the support of commercial stakeholders (pharmaceutical companies), take over a part of the functions of the health care institution such as drug supply, diagnostics, training medical personnel and patients, as well as infrastructural support [8].

IMPLEMENTATION OF ENCHMARKING SYSTEM AT THE NATIONAL LEVEL

Benchmarking is a systematic research, comparison and analysis of key indicators, processes, functional features and trends of the company with similar indicators among both competitors, and leaders from other areas. It helps to identify gaps in the company functioning and ways to eliminate them by introducing the best practices. Benchmarking provides a systematic approach to the issue of identifying reference points for development and efficiency improvement. In public health care, benchmarking is used for the rating system of medical organizations [10]. Benchmarking is an obligatory tool for the implementation of value-based healthcare projects, since it makes it possible to compare the work of both medical organizations and private services and medical specialists [10, 22, 26]. Owing to dynamic comparison, the principle of competition and improvement of the quality of medical care can be implemented [10, 22, 26].

Benchmarking provides a sufficiently high degree of reliability of the results in case the methodology of benchmarking research is followed. Using the tool is complicated as it requires a good knowledge of benchmarking methodology, experience in conducting such studies, time and in some cases resources to obtain data. The introduction of benchmarking (rating system) is possible if the approaches to assessing the results of medical care are standardized. Various foreign organizations develop and implement standardized sets (checklists) of outcomes assessment [28]. Thus, according to ICHOM methodology, data on the results of medical care can be divided into three categories: "Achieved health status", "Recovery process", "Sustainable result" [28].

DISCUSSION

Implementation of value-based approach programs in oncology requires active participation and coordination of support measures with all stakeholders: adaptation of the staff schedule and effective contract provisions, organization of team training, implementation of developed SOPs (standard operating procedures), adaptation of routing, exchange of cancer patient monitoring data, integration with federal and regional services.

Limitations of the research. Despite the fact that individual tools of the value-based approach were previously successfully implemented in Russian oncological service, these projects have not been implemented as a comprehensive program, which may require clarification in the future.

CONCLUSION

The implementation of value-based principles requires reformatting of the entire healthcare system with a change in financing methods, approaches to oncological care, revision of key performance indicators for medical personnel, and creation of rational stimulation for participants. Taking into account the complexity in implementing such projects, it is recommended to start with individual elements — oncologic nosologies that contribute most to morbidity and mortality.

The expected results of the implementation of value-based healthcare projects according to the stated roadmap include:

1) increased efficiency of oncology services at the scale of individual regions and the whole country through operational efficiency and concentration of resources which are important for patients;
2) increasing patient adherence to treatment through patient-centered external (at the regional level) and internal (within the medical organization and structural subdivisions) routing;
3) increasing patient satisfaction through the introduction of patient-centered principles of work, taking into account the patient's opinions and his individual psycho-emotional and social needs when choosing a method of treatment;
4) improvement of interdisciplinary interaction, compliance with clinical recommendations, which ultimately improves the quality of medical care.

To replicate centers of competence and create a platform for benchmarking, it is necessary to have a flexible digital infrastructure with the ability to monitor costs and results of medical care at the individual level (at the level of a particular patient). The software should enable transparent and objective monitoring of both clinical and patient data. When co-creating software, it is necessary to take into account the existing digital infrastructure of the region and the medical organization.

ADDITIONAL INFORMATION

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STAFFING SHORTAGE OF NURSING PERSONNEL AS AN ACTUAL HEALTH CARE PROBLEM

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ABSTRACT. The problem of nursing shortage is one of the most important health care problems in the world at whole and in Russia. It affects lowering the level of nursing care quality, the level of interaction between different categories of staff and finally patient satisfaction. Being common for all medical institutions, there are still specific features of these processes in certain regions, including large cities. So the purpose of this study was to analyze the dynamics and trends of the provision of nursing personnel in St. Petersburg. The official statistics data were used with the calculation of extensive, intensive, ratio indicators, dynamic series (with their alignment by the least squares method), calculation of indicators trends up to 2030. It was found that in 2009 the index of provision of nursing personnel in St. Petersburg was 93.6 (per 10 thousand population), and in 2018 it decreased to 81.9 (by 12.5%). There was also a decreasing of this indicator in medical organizations of regional subordination (from 73.6 to 70.3), but the rate of this decreasing was significantly lower (4.5%). In general, the decline in overall was steady, and according to development forecasts it will continue, the dynamics in regional organizations was multidirectional and some growth of the indicator may be seen in the future. The provision of nurses and midwives decreases in dynamics, and the provision of nurses and X-ray technicians is increasing. The ratio of doctors to nursing staff in the city as a whole decreased from 1.5 to 1.4 with a tendency to a subsequent decrease, for regional organizations it increased from 1.16 to 1.4 and in the future it may increase to 2.2. Staffing in general and in regional medical organizations differs slightly and the changes in dynamics are not significant. In future we should expect a decrease of this indicator. Thus, the study showed a pronounced shortage of nursing personnel in medical organizations of St. Petersburg (especially in federal organizations), which requires the adoption of comprehensive measures aimed to stabilize and improve this situation.

KEY WORDS: personnel shortage; nursing personnel.

КАДРОВЫЙ ДЕФИЦИТ СРЕДНЕГО МЕДИЦИНСКОГО ПЕРСОНАЛА КАК АКТУАЛЬНАЯ ПРОБЛЕМА ЗДРАВООХРАНЕНИЯ

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РЕЗЮМЕ. Проблема кадрового дефицита среднего медицинского персонала является одной из наиболее актуальных проблем здравоохранения в мире и в России, что отражается на качестве всех видов сестринской помощи, уровне взаимодействия разных категорий персонала, удовлетворенности пациентов. При общности этих процессов имеется специфика в отдельных регионах, в т.ч. в крупных городах. Цель настоящего исследования — анализ динамики и тенденций обеспеченности средним медицинским персоналом в Санкт-Петербурге. Для анализа использовались данные официальной статистики с расчетом экстенсивных, интенсивных, показателей соотношения, динамического ряда (с их выравниванием методом наименьших квадратов), расчетом трендов показателей до 2030 г. Установлено, что в 2009 г. показатель обеспеченности средним медицинским персоналом в городе составлял 93,6 (на 10 тыс. населения), а в 2018 г. он снизился до 81,9 (т.е. на 12,5%). Снижение имело место и по медицинским организациям регионального подчинения (с 73,6 до 70,3), однако темп этого снижения был значительно ниже (4,5%). В целом по городу снижение носило устойчивый неуклонный характер и, согласно прогнозу, будет продолжаться. В региональных организациях динамика была разнонаправленной, и в перспективе вероятен некоторый рост показателя. В динамике снижается обеспеченность фельдшерами и акушерками, увеличивается — медицинскими сестрами, рентгенлаборантами. Показатель соотношения врачей и среднего медицинского персонала в целом по городу снизился с 1,5 до 1,4 с тенденцией к последующему уменьшению. По региональным организациям он увеличился с 1,16 до 1,4 и в перспективе возможен его рост до 2,2. Укомплектованность кадрами в целом и по региональным организациям отличается незначительно и мало меняется в динамике, составляя по ставкам более 80% и по физическим лицам более 60%. В перспективе следует ожидать снижения укомплектованности по занятым ставкам. Таким образом, исследование показало выраженный дефицит кадров среднего медицинского персонала (особенно фельдшеров и акушерок) в медицинских организациях города (особенно федерального подчинения), что требует принятия комплексных мер, направленных на стабилизацию и улучшение ситуации.

КЛЮЧЕВЫЕ СЛОВА: кадровый дефицит; средний медицинский персонал.

INTRODUCTION

The most important condition for the development of the national healthcare system is its provision of personnel. The state program of healthcare development of the Russian Federation contains a separate sub-program “Staff resource management in healthcare” [9]. The most numerous personnel component is the nursing staff, without the proper number of which and a high level of qualifications, it is impossible to solve the problem of providing the population with affordable and high-quality medical care [16, 17]. It is difficult to overestimate the role of nursing personnel in primary health care, especially when carrying out preventive and rehabilitation measures, palliative and specialized care, when the patient needs not only treatment, but also care and psychological support [12]. At the same time, with the development of medical and organizational technologies, the functions of all categories of nursing staff are expanding and becoming more complex, who have long ceased to be just a doctor’s assistant and a simple executor of his appointments, which, consequently, increases the requirements for the level of training and qualifications of these specialists [19]. Solving these tasks is complicated by the worldwide problem of shortage of nursing personnel [18]. According to World Health Organization data, there is a shortage of 9 million specialists in the world. In the Russian Federation there is a shortage of about 300 thousand nurses [15]. The staffing level of paramedical personnel by individuals averages 66.8% and is almost one and a half times lower than the staffing level by employed rates [13]. This situation is typical both for the country as a whole and for its certain regions [1, 6, 7, 10, 11, 14]. The shortage of nursing staff and, accordingly,

the low ratio of doctors and nursing personnel cause an imbalance in the medical care system and limit the possibilities for the development of aftercare, patronage, and rehabilitation services. There are a number of reasons contributing to this situation [2, 4, 8]: low wages of paramedical workers, equalizing approaches to pay, low level of social security, inconsistency of educational standards of higher nursing and secondary medical education and the level of their implementation with modern healthcare needs, low prestige of the profession both in society and in the professional medical setting. Given the commonality of the listed problems and trends in the world, Russia, and individual regions, the development of specific ways to solve them requires a thorough analysis of the situation at various levels of management [3, 5].

AIM

The aim of this study is to analyze the dynamics and trends of the provision of nursing personnel in St. Petersburg.

MATERIALS AND METHODS

To conduct the study, data from the Federal State Statistics Service (https://rosstat.gov.ru/folder/13721) and the Rosstat regional office of St. Petersburg and Leningrad Region (https://petrostat.gks.ru/folder/27954) were used. On their basis, a number of extensive and intensive indicators were calculated, time series with the calculation of the corresponding indicators were constructed, their alignment by the least squares method was carried out, and indicators trends were constructed up to 2030. To study long-term dynamics, we chose a ten-year interval (2009–2018) before the start of the pandemic, when, for obvious reasons, there have been significant changes in both the population and the number of medical personnel. To analyze the trends of the number and provision of certain categories of health personnel (which is more inert compared to general indicators of provision), a longer time lag (since 1970) was studied. For a number of indicators, the available databases had information only since 2014, so the article provides an analysis of them. Statistical calculations were made using application package STATISTICA 6.0. As St. Petersburg has medical organizations of both federal and regional subordination, data were analyzed both for the city as a whole (to get a general overview of the situation) and for regional organizations (staff management problems in which can be solved at the level of a constituent entity of the Russian Federation).

RESULTS AND DISCUSSION

If in 2009 the rate of provision of nursing personnel in St. Petersburg was 93,6 (per 10 thousand population), then in 2018 it decreased to 81,9 (i.e. by 12,5%). The analyzed indicator is lower than the all-Russian indicator (86,2), but significantly higher than the similar indicator for Moscow (69,1). The decrease took place both in all medical organizations (including federal ones) and in medical organizations of regional subordination (from 73,6 to 70,3), however, the rate of this decrease in the latter was significantly lower (4,5%), which may be due to the greater interest of staff in working in regional medical organizations, where there are additional (at the expense of the regional budget) payments to medical workers. It is also important to note that while in the city as a whole the decline was sustained a steady, and, according to the forecast made, it will continue (Fig. 1), then in regional organizations the dynamics were multidirectional. Thus, the indicator decreased from 2009 to 2013; in 2014 there was a sharp jump (by 13,2% compared to the previous year); the indicator maintains in 2015, and then its decline is noted again, the rate of which was maximum (4,4%) in 2018. Taking into account the ambiguity of the dynamics, we aligned the dynamic series. At the same time, it was established that the long-term trend is a gradual increase in the indicator of nursing personnel (Fig. 2). By 2030, the level of provision may increase to 76,3 (per 10 thousand population).

A study of the long-term dynamics of the provision of the city population with various categories of nursing staff showed that the provision of paramedics increased at a relatively low rate from 1970 (22,3 per 10 thousand population) to 1990 (27,8 per 10 thousand population), and then began to decline rapidly, and in 2018, compared to 1970, the indicator decreased by 2,4 times, amounting to 9,2. The availability of midwives is constantly decreasing: from 21,9 (in 1970) to 7,0 (in 2018) — a 3-fold decrease.

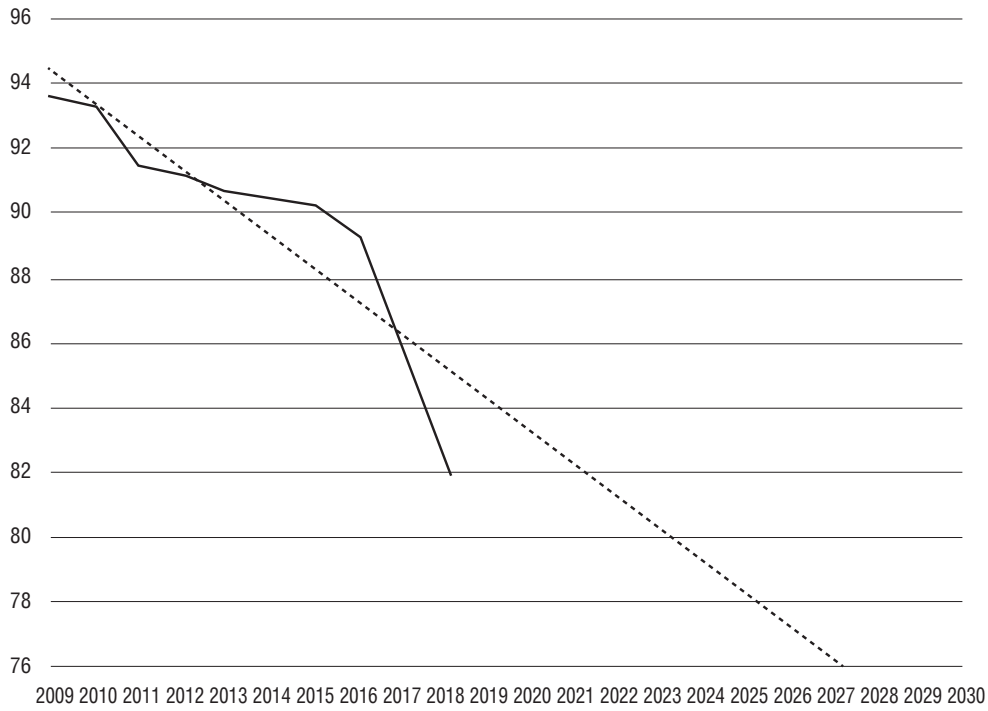

Fig. 1. Dynamics of availability of nursing staff in medical organizations of St. Petersburg (standard and equalized figures) and the trend up to 2030 (per 10 thousand population)

Рис. 1. Динамика обеспеченности средним медицинским персоналом медицинских организаций Санкт-Петербурга (обычные и выравненные показатели) и тренд до 2030 г. (на 10 тыс. населения)

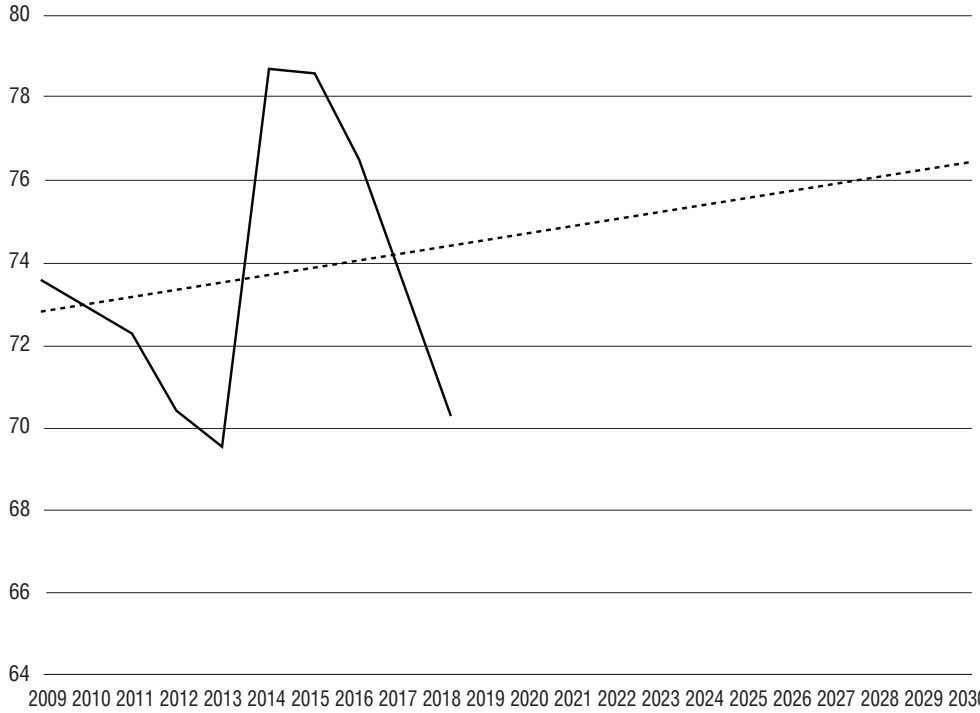

Fig. 2. Dynamics of provision of regional medical organizations with nursing staff (fixed and equal indicators) and forecast till 2030 (per 10 thousand population)

Рис. 2. Динамика обеспеченности региональных медицинских организаций средним медицинским персоналом (обычные и выравненные показатели) и прогноз до 2030 г. (на 10 тыс. населения)

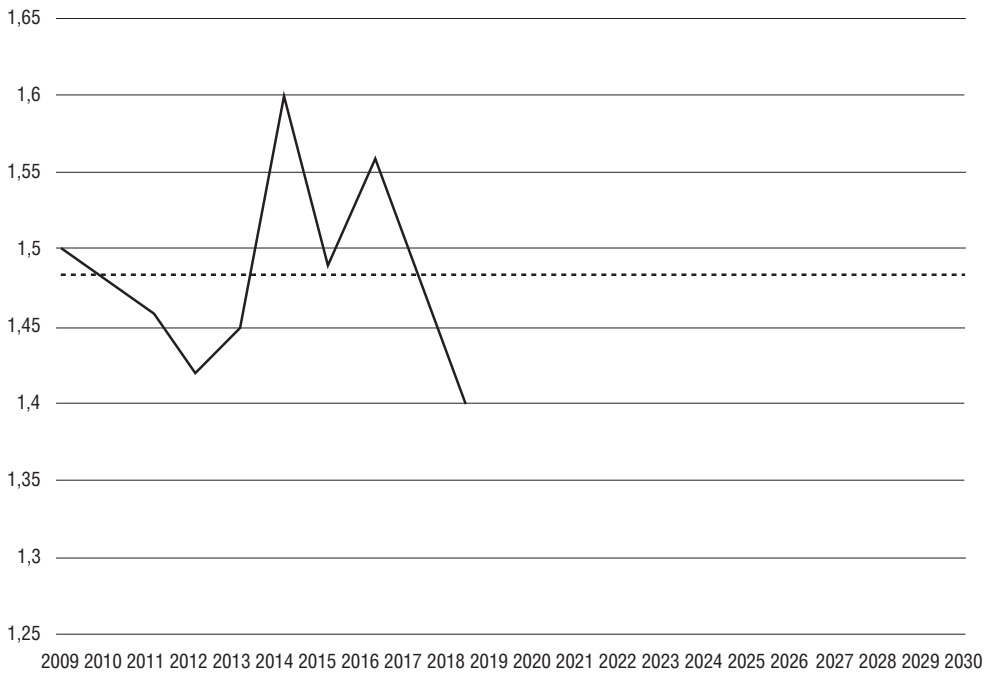

Fig. 3. Dynamics and forecast of the ratio of doctors and nursing staff in St. Petersburg in general

Рис. 3. Динамика и прогноз показателя соотношения врачей и среднего медицинского персонала в целом по Санкт-Петербургу

At the same time, the number of nurses is growing: during the analyzed period it increased 1,6 times (45,3 and 72,5, respectively). The provision of laboratory assistants increased from 1970 (3,5) to 2005 (7,5); subsequently, the indicator began to decline, amounting to 6,0 in 2018, remaining, however, above the 1970 level of 1,7 times. The number of X-ray technicians is constantly increasing: in general, during the analyzed period by 2,6 times (1,0–2,6).

The ratio of doctors to nursing staff is changing over time, remaining, however, significantly lower than the WHO recommended indicator and the indicator planned by government projects. In the city as a whole, starting from 2009, the ratio has tended to decrease (the exceptions were 2014 and 2016), the rate of which was maximum in 2017 and 2018 (5,1 and 5,4% respectively). Over the analyzed period, the fluctuations in the indicator average from 1,42 to 1,56. The leveling of the indicator (Fig. 3) shows that in the long term there is no dynamics of the ratio between doctors and nursing personnel, and in the future it may even decrease slightly.

In regional medical organizations in 2009, the ratio was 1,16; subsequently, its growth was noted (to a maximum value of 1,61 in 2015, when the growth rate was 9,1%), but in 2016–2018 the dynamics again become negative (the ratio in 2018 was 1,4), while the rate of decline in the indicator increases annually (6,0% in 2018). At the same time, the long-term trend is an increase in the indicator, which by 2030 can be 2,2 (Fig. 4).

An important role in analyzing staffing is to study the staffing level both by rates and individuals. In the city as a whole, the percentage of staffing by employed rates is decreasing over time: from 85,8% in 2014 to 82,0% in 2018 (4,4%). At the same time, the staffing ratio by individuals generally has an upward trend (60,9–61,4%), which will continue (Fig. 5).

In regional medical organizations, there is a dynamic reduction in the number of employed positions nursing positions (in 2018, the indicator of visibility was 88,9%); the rate of decline in the indicator was maximum (3,9%) in 2017. The number of individuals decreased over this period by 6,9%, and the dynamics show an increase in the rate of decline in the number of individuals. The staffing rate of nursing staff by employed rates in regional medical organizations exceeds 80% and has a clear downward

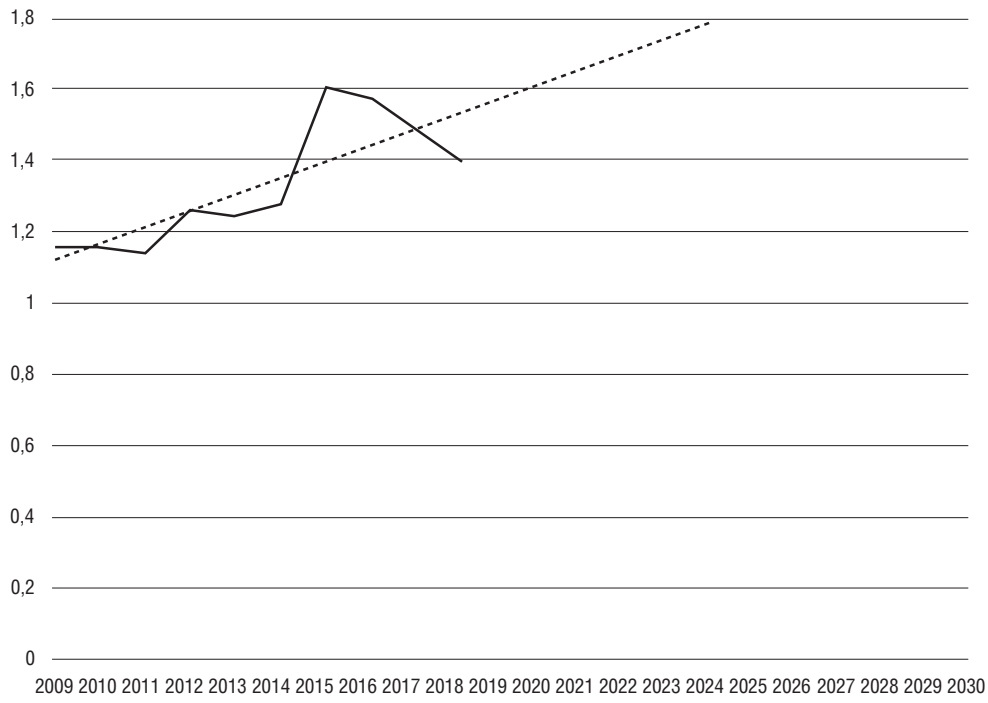

Fig. 4. Dynamics of the ratio of doctors and nurses in regional medical organizations (fixed and equalized indicators) and its developmental forecast until 2030

Рис. 4. Динамика показателя соотношения врачей и среднего медицинского персонала в региональных медицинских организациях (обычные и выравненные показатели) и его прогноз до 2030 г.

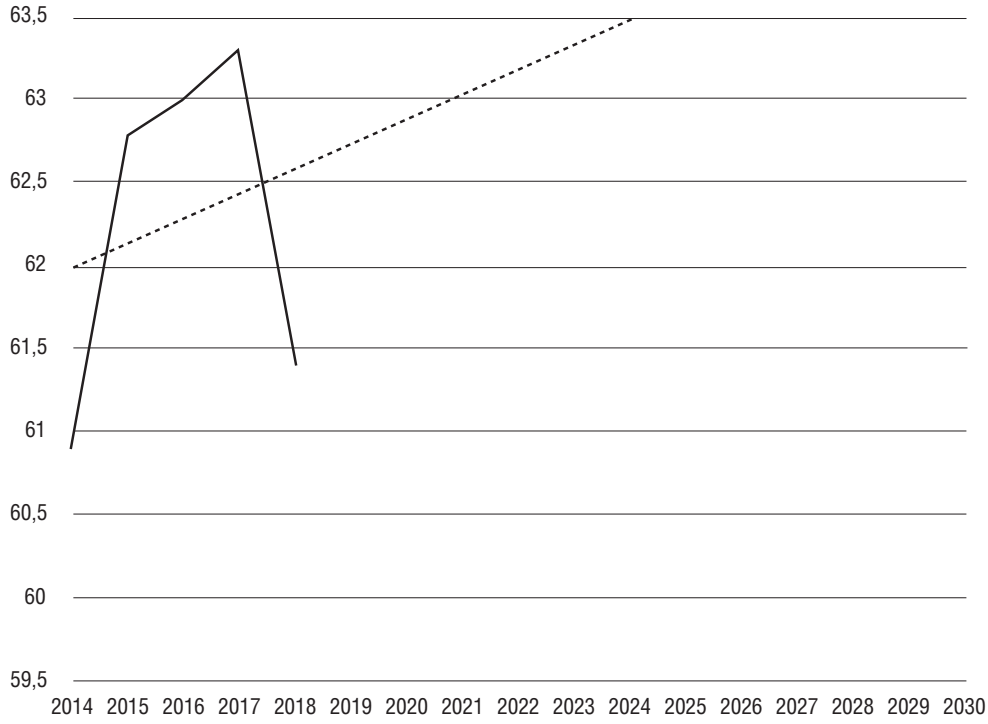

Fig. 5. Dynamics and prognosis of staffing of St. Petersburg medical organizations by natural persons, in percent

Рис. 5. Динамика и прогноз укомплектованности физическими лицами среднего медицинского персонала медицинских организаций Санкт-Петербурга, в процентах

trend (85,8–81,6%; the indicator of visibility in 2018 was 95.1% compared to 2014), and according to the forecast (Fig. 6), this trend will continue; the staffing rate by individuals is slightly higher than 60% (60,3% in 2018) and practically does not change in dynamics with a downward trend in the long term (Fig. 7).

The structure of paramedical personnel is dominated by nurses (accounting for 77,0%). They are followed by: midwives (7,3%), paramedics (7,0%), laboratory assistants (4,6%), pharmacists (0,5%). 7,9% accounts for other categories of paramedical workers. An analysis of the staffing levels of these categories of employees in 2018 in regional organizations showed that by employed rates the indicator ranges from 74,3% (pharmacists) to 87,8% (paramedics), and by individuals — from 45,3% (laboratory assistants) up to 71,9% (paramedics). Thus, it can be stated, firstly, that among all categories of paramedical workers there is a shortage of personnel, and relative "well-being" with staffing is achieved through part-time job, and, secondly, that the tensest situation is with laboratory assistants and pharmacists and other personnel.

A study of the level of provision of the city by various categories of paramedical workers showed the following (Table 1). The highest availability (64 per 10 thousand population) is noted in the staff of nurses, and in St. Petersburg it is higher than the Russian average (59,7), and significantly ($p < 0,05$) higher than in Moscow. Also in St. Petersburg, the number of nurses with higher education is almost twice as high as in Russia, and 2,5 times than in Moscow. Among the various categories of nurses, the maximum provision is of pediatric nurses (74,0), which also significantly exceeds that in the Russian Federation and Moscow. Next comes the indicator of the provision of ward (procedural) nurses (18,8), which is higher than the comparable indicators. The number of nurse anesthetists and operating room nurses (3,61 and 3,14, respectively) is higher than the national average and in Moscow. At the same time, the provision of district nurses (2,0) and general practice nurses/family nurse practitioners (0,75) is very low (and lower than in the Russian Federation and Moscow). The number of physical therapy nurses is 2,15, which is comparable to the all-Russian indicator and

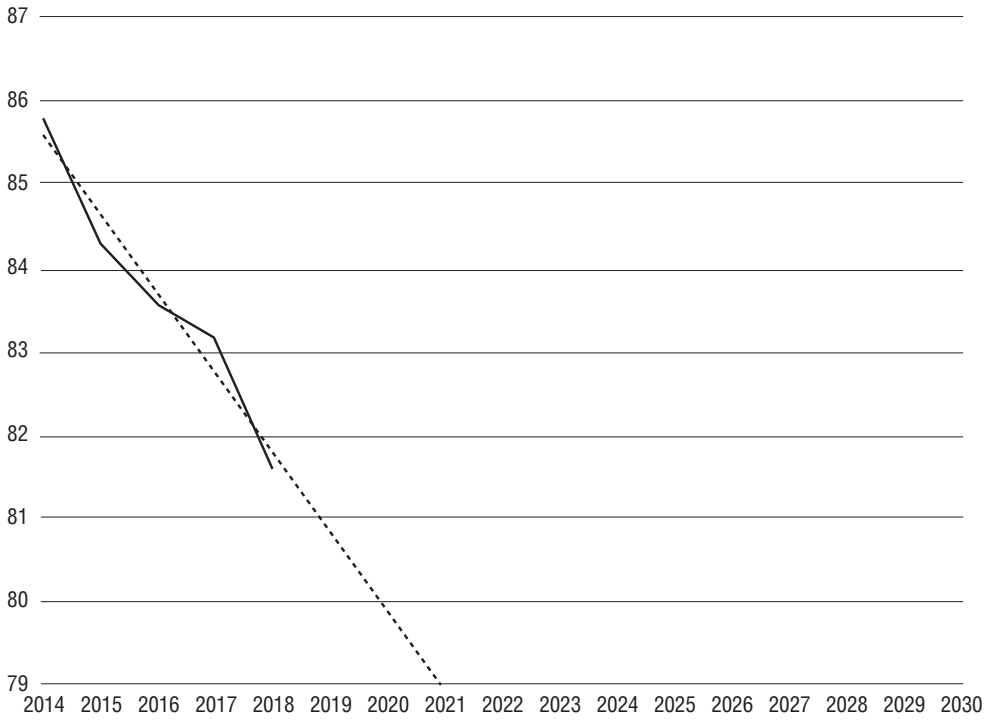

Fig. 6. Dynamics and Prognoses of Staffing Ratio by Employed Rates in Regional Medical Organizations, in percent

Рис. 6. Динамика и прогноз показателя укомплектованности штатов по занятым ставкам в региональных медицинских организациях, в процентах

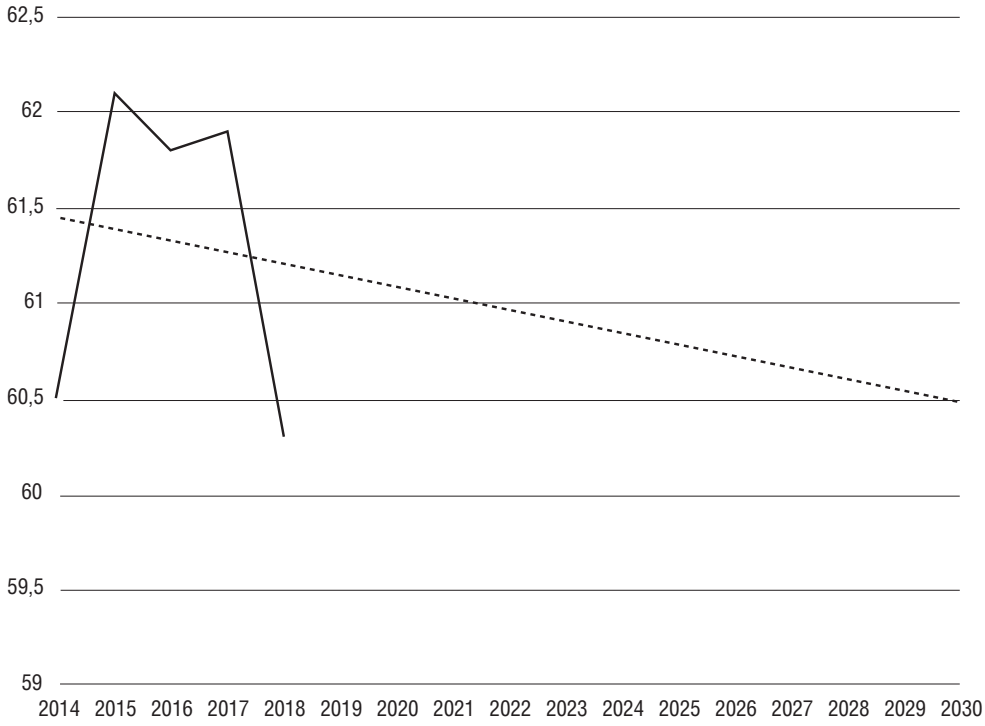

Fig. 7. Dynamics and prognoses of staffing ratio of regional medical organizations by natural persons, in percent

Рис. 7. Динамика и прогноз показателя укомплектованности региональных медицинских организаций физическими лицами, в процентах

Table 1

Availability of various categories of nursing staff in 2018 per 10 000 population

Таблица 1

Показатель обеспеченности различными категориями кадров среднего медицинского персонала в 2018 г. на 10 тыс. населения

Nursing staff categories / Категория СМП	**St. Petersburg / Санкт-Петербург**	**Russia / Россия**	**Moscow / Москва**
Nursing managers / Организаторы сестринского дела	1,4	0,91	1,18
Midwives / Акушерки	4.4	8,5	4,1
Paramedics / Фельдшеры	4,97	7,68	6,08
Laboratory Technicians / Лаборанты	0,58	1,0	0,33
Nurses, incl. / Медицинские сестры, в т.ч.	64,0	59,7	50,8
With higher education / Имеющие высшее образование	0,67	0,36	0,25
General practice / Общей практики	0,75	0,94	0,93
Ward / Палатные	18,8	17,4	16,3
District / Участковые	2,0	3,38	2,06
Pediatrics / По педиатрии	44,8	46,8	50,6
Anesthesiology / По анестезиологии	3,61	3,07	2,77
Operating / Операционные	3,14	2,24	2,7
By Rehabilitation / По реабилитации	0,02	0,01	0
Massage / По массажу	1,87	1,29	1,01
Physical therapy / По физиотерапии	2,15	2,05	1,06
Nursing management specialists / Специалисты по управлению сестринской деятельностью	0,26	0,17	0,16
Physical Therapy Instructors / Инструкторы ЛФК	0,61	0,32	0,33
X-ray technicians / Рентгенлаборанты	2,55	2,19	2,30

twice as high as the indicator in Moscow; the number of nurse massage therapists — 1,87 (slight excess). The minimum provision (0,02) is noted among rehabilitation nurses. In second place in terms of availability is such category of nursing personnel as paramedics (4,97), and in third place are midwives (4,4). In both cases, this indicator is lower than the all-Russian one, and in the first case, it is lower than the indicator for Moscow. The provision of X-ray technicians is 2,55 (approximately at the level of comparable indicators); nursing administrators and specialists in nursing management — 1,4 and 0,26, respectively (above the all-Russian and Moscow indicators). The number of physical therapy instructors is relatively low (0,61), although the indicator is almost twice as high as in Russia as a whole and in Moscow. Therefore, it can be stated that the most pressing problem for the city's healthcare is the provision of personnel in the primary care network — district nurses (general practice nurses), as well as paramedics.

CONCLUSION

Thus, the analysis showed that the problem of providing medical organizations in St. Petersburg with nursing personnel not only remains relevant, but will also persist for at least another 10 years. The existing indicator of provision and staffing is strongly related to the presence of part-time job, because these indicators by individuals are significantly lower than those by employed rates. The dynamics in the human resources of paramedics and midwives are especially unfavorable. Due to insufficient provision, the ratio of doctors to nursing personnel remains low, which makes it difficult for both to perform functional duties. All this requires the adoption of a system of measures aimed at increasing the number of paramedical staff in the city, including a significant increase in wages (excluding part-time jobs), active promotion and increasing the prestige of the profession, the availability of social benefits, strengthening interaction between employers and educational institutions, the introduction of targeted admissions with possible payment for training at the expense of employers in the most in-demand specialties, provision of opportunities for career and professional growth, etc.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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OUTPATIENT SURGERY AT THE PEDIATRIC UNIVERSITY: DEVELOPMENT PROSPECTS

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ABSTRACT. Outpatient surgery is an addition to planned inpatient care, which has certain advantages for both patient and hospital, insurance companies and other healthcare providers. Back to 2018, the chief surgeon of the Ministry of Health of Russia, director of the MSRC after A.V. Vishnevsky, Academician of the Russian Academy of Sciences A.Sh. Revishvili noted that, taking into account the experience of surgeons since the beginning of the 20th century, part of the surgical care ought to be altered to the outpatient format. The development of outpatient ENT surgery, as well as general surgery in the outpatient healthcare sector, is a promising direction for the future. Since 2020, St. Petersburg State Pediatric Medical University has been performing planned surgical interventions according to the ENT profile in the CDC. The volume of surgical treatment includes adenotomy, adenotonzillotomy, adenovasotomy under general anesthesia. In total, from September 2020 to June 2022, 120 children aged 3 to 15 years were operated in outpatient department as part of one-day surgery. All children underwent a complete laboratory and instrumental preoperative examination, medical preparation. After observation for 4–6 hours, patients were discharged from the outpatient department for a course of outpatient aftercare with recommendations. A follow-up examination was also performed 7 days later. The development of this direction will intencify the work of an inpatient bed, reduce the waiting time for planned hospitalization of patients with more severe ENT pathology. Planned outpatient surgical care in other cases of ENT pathology is also sure to develop.

KEY WORDS: outpatient surgery; children; otorhinolaryngology.

АМБУЛАТОРНАЯ ЛОР-ХИРУРГИЯ В ПЕДИАТРИЧЕСКОМ УНИВЕРСИТЕТЕ: ПЕРСПЕКТИВЫ РАЗВИТИЯ

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РЕЗЮМЕ. Амбулаторная хирургия — это дополнение плановой стационарной помощи, которая имеет определенные преимущества как для пациента, так и для стационара, страховых компаний и других звеньев здравоохранения. Еще в 2018 году главный хирург Минздрава России, директор НМИЦ хирургии имени А.В. Вишневского, академик РАН А.Ш. Ревишвили отметил, что с учетом опыта хирургов с начала XX века нужно перевести часть хирургической помощи в формат амбулаторной. Развитие амбулаторной ЛОР-хирургии, а также в дальнейшем и общей хирургии в амбулаторном звене здравоохранения, является перспективным направлением. В Санкт-Петербургском государственном педиатрическом медицинском университете с 2020 года выполняются плановые хирургические вмешательства по ЛОР-профилю в условиях КДЦ. Объем хирургического лечения — аденотомия, аденотонзиллотомия, аденовазотомия с применением общей анестезии. Всего с сентября 2020 г. по июнь 2022 г. амбулаторно в рамках хирургии одного дня прооперировано 120 детей в возрасте от 3 до 15 лет. Всем детям выполнено полное лабораторно-инструментальное предоперационное обследование, медикаментозная подготовка. После проведения хирургического лечения пациенты наблюдались в течение 4–6 часов, после чего выписывались на амбулаторное наблюдение с рекомендациями. Спустя 7 дней производился контрольный осмотр. Развитие данного направления позволит оптимально разгрузить отделение стационара, сократив время ожидания для пациентов с более тяжелой плановой ЛОР-патологией. Планируется также развитие плановой амбулаторной хирургической помощи по другим профилям.

КЛЮЧЕВЫЕ СЛОВА: амбулаторная хирургия; дети; оториноларингология.

INTRODUCTION

In 1909, the Scotsman J. Nicol made a report to the British Medical Association on 8988 successful surgeons operations performed on children on an outpatient basis. Later, it was with this that the «birth» of outpatient surgery was associated, which has since started its development. In 1916, R. Waters was the first in the United States to open the Ambulatory Surgery Center (ASC), which later took its place in the healthcare system and medical education in the 70s of the 20th century. In 1938, G. Herzfeld presented material on the performance of more than 1000 hernia repairs in a one-day hospital over a period of 4 years. Then, in 1960, in England, J. Stallworthy presented his data showing a reduction in the length of hospital observation for patients undergoing surgery [8]. In Russia, “one-day surgery” was first introduced in 1963. Leningrad doctors published their experience accumulated over 4 years. The experience was based on 465 surgeries performed in the outpatient setting. The results of the treatment were good. The outcome of this movement was the emergence of a new direction in outpatient surgery — hospital-substituting forms of medical care to population [1, 3, 7, 9]. In 2018, the chief surgeon of the Russian Ministry of Health, director of the National Medical Research Center for Surgery named after A.V.Vishnevsky, academician of the RAS A.Sh.Revishvili noted outpatient surgery as “minor surgery”: “...It is necessary to transfer some types of surgical care from hospitals to the outpatient stage, and also to develop a system of surgical hospitals in polyclinics” [2]. The author, according to his concept, assigned the main role in the development of this direction to surgeons: “The basic idea of the strategy is dependence on the efforts of all parties equally. ... In this regard, the process of transition from «minor ambulatory surgery» to «major ambulatory surgery» is of particular interest” [4–6].

AIM

The aim and objectives of the study are to present a range of pathology for possible surgical treatment in a one-day hospital setting from practical medicine and healthcare and to assess

the current state of outpatient surgery using the example of patients with ENT pathologies.

MATERIALS AND METHODS

Since September 2020, at the Consultative and Diagnostic Center (CDC) of the St. Petersburg Pediatric Medical University (SPbGPMU), planned surgical interventions in the field of otorhinolaryngology have been performed. The structure of the diagnostic center has an equipped operating unit, in which there are a pre-operative, operating, post-operative observation rooms. Patients undergo an approved examination algorithm in the pre-operative period, where indications for surgical treatment and contraindications for elective surgical treatment in the CDC are determined and confirmed, and a set of tests required before planned surgical treatment is performed. Of particular importance was the study of the hemostasis system. The CDC also performs outpatient surgical procedures in the profile of surgery, ophthalmology and maxillofacial surgery.

Outpatient surgical otorhinolaryngology is one of the direction of modern medicine, which makes it possible to reduce the number of hospital bed days and increase hospital bed occupancy for patients with more severe ENT pathology, which will lead to improved bed occupancy rates and more rational use of the budget. However, equipping ambulatory surgery centers requires proper planning, modern, sufficient and high-tech facility, as well as training and recruitment of qualified personnel.

The absolute indications for adenotomy were prolonged difficulty in nasal breathing, persistent impairment of ventilation of the middle ear cavities, which is manifested by frequent otitis media and hearing loss, as well as chronic adenoiditis with common exacerbations and lack of effect of conservative treatment for 6 months. For each child, indications for adenotomy are determined individually, based on complaints, duration of illness, the effectiveness of previously carried out conservative treatment and examination data.

Patients who apply to the CDC on an outpatient basis under a CHI (compulsory health insurance) policy, for a fee, or under a VHI (voluntary health insurance) policy pass a selection committee and, if necessary, undergo further examination by related CDC specialists on an outpatient basis. After determining the indications for surgical treatment in the absence of severe concomitant somatic pathology, surgery can be performed in the outpatient surgery center of the CDC (one-day hospital).

The operational day plan:

1. Examination of a patient by an attending physician, preparation of medical documentation, analysis of laboratory data. Conversation with parents.
2. Examination of a patient by an anesthesiologist-resuscitator in the observation ward.
3. Performing planned surgical intervention.
4. Monitoring of a patient in the observation ward.
5. Postoperative patient assessment, thermometry, drug therapy (prescribed individually).
6. Discharge of a patient with recommendations for outpatient follow-up care.

The observation time for a patient in the postoperative period ranged from 4 to 6 hours. The patient is discharged in satisfactory condition, with normal objective data with recommendations. If complications arise in a child in the early postoperative period, as well as if it is necessary to monitor the child for more than 6 hours, the patient is transferred to the hospital of St. Peters-

Table 1

Distribution of patients by age and gender

Таблица 1

Распределение пациентов по возрасту и полу

Пол/Возраст ребенка Age of the child / Gender	**3–6 years / old 3–6 лет**	**6–9 years old / 6–9 лет**	**9–12 years old / 9–12 лет**	**12–15 years old / 12–15 лет**	**Total: / Итого:**
Male / Мальчики	22 (46,8%)	29 (54,7%)	5 (46,2%)	5 (62,5%)	61 (50,8%)
Female / Девочки	25 (53,2)	24 (45,3%)	7 (53,8%)	3 (37,5%)	59 (49,2%)
Total: / Итого:	47 (40%)	53 (44%)	12 (10%)	8 (6%)	120

burg State Pediatric Medical University for dynamic observation.

RESULTS

From September 2020 to June 2022, 120 operations in the field of otorhinolaryngology were performed at the CDC of St. Petersburg State Pediatric Medical University.

Among children under 6 years of age, girls predominated, their number was 25 (53,2%) and there were 22 (46,8%) boys. In total, 48 children were operated on in this group of children. In the group of children from 6 to 9 years old, boys predominated — 29 people (54,7%), there were 24 girls (45,3%), a total of 53 children. In the next age group (from 9 to 12 years old), girls predominated — 7 people (53,8%), boys — 5 (46,2%), a total of 13 children. And in the group from 12 to 15 years old, 8 children were operated on, of which 5 boys (62,5%), 3 girls (37,5%) (Table 1).

In preschool age, the volume of surgical procedures in the form of adenotomy predominated in 33 patients (70,3%), the number of adenotonsillotomies was performed in 14 children (29,7%). At primary school age, the scope of surgical intervention in children also predominated in the form of adenotomy — performed in 40 patients (76,9%), adenotonsillotomy was performed in 12 children (91,6%), tonsillotomy — in one child (8,3%), girls 6 years old. She previously had adenotomy surgery performed in 2020 at another medical institution. Due to the presence of grade III hypertrophy of the palatine tonsils, the presence of sleep apnea in the child for up to 20 seconds, the absence of hematological signs of herpes virus infection, a calm somatic status and the absence of signs of a recurrent tonsillitis, the girl underwent surgical treatment in this amount (Table 2).

CONCLUSION

1. Since 2020, more than 120 surgeries under general anesthesia have been performed at the CDC of St. Petersburg State Pediatric Medical University. The range of children is mainly from 6 to 9 years old, the most common volume of surgery is adenotomy. The success of the surgical interventions is associated with the coordinated work of all specialists involved in elective outpatient surgical treatment.

2. Further development of elective outpatient surgery leads to the expansion of one-day surgery capabilities, an increase in hospital bed occupancy, and a reduction in costs per patient in the ENT department of a hospital (provided that the patient has no contraindications in terms of the volume and type of surgery, as well as somatic pathology).

3. Optimally organized work of the ambulatory surgical service will reduce the increased burden on doctors in the ENT department of the hospital, who are often forced to provide elective outpatient surgical care in the ENT department for social and paramedical reasons. This strategy will also help better equip ambulatory surgery centers and focus on specialist training.

Table 2

The volume of surgical treatment depends on gender and age

Таблица 2

Объем оперативного лечения в зависимости от пола и возраста

Age/scope of surgical treatment / Возраст/объем хирургического лечения	**3–6 years old / 3–6 лет**	**6–9 years old / 6–9 лет**	**9–12 years old / 9–12 лет**	**12–15 years old / 12–15 лет**	**Total: / Итого:**
Adenotomy / Аденотомия	33 (37%)	40 (46%)	11 (12%)	5 (5%)	89 (74%)
Adenotonsillotomy / Аденотонзиллотомия	14 (54%)	12 (46%)	–	–	26 (21%)
Adenovasotomy / Аденовазотомия	–	–	1 (25%)	3 (75%)	4 (3%)
Tonsillotomy / Тонзиллотомия	–	1 (100%)	–	–	1 (0.8%)
Total: / Итого:	47 (39%)	52 (43%)	12 (10%)	8 (6%)	120

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisi-tion, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

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THE PROBLEM OF OCCUPATIONAL STRESS OF PEDIATRICS IN PANDEMIC CONDITIONS

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ABSTRACT. An important outcome of the COVID-19 pandemic has been a decrease in the quality of life of medical workers. Numerous studies concluded that medical workers acquired emotional and physical problems as a result of overload and severe stress during the fight against coronavirus. This article describes the results of a survey of medical workers on the leading factors of occupational stress during the pandemic, highlighting relevant strategies for overcoming occupational stress marked by respondents themselves, and analysis of the most valuable factors of their professional activities that helped them overcome stress. Also, as part of the study, an assessment was made of the emotional state and quality of life of the COVID department employees, the level of manifestation of various symptoms of professional maladjustment and a tendency to develop addictive behavior. Employees of the department for children with the new coronavirus infection COVID-19: ward doctors, nurses and junior medical staff took part in the survey. More than half of the respondents mentioned factors of professional maladjustment among which are mainly physical ailments and certain emotional problems. The department employees note the need to revise the work schedule to reduce fatigue and have identified various factors that are most significant for them at work, which help to overcome difficulties and stress. A decrease in quality of life indicators was reported in 38.5% of doctors and 52.4% of nurses. 62% of respondents revealed a pronounced tendency to various addictions, to a greater extent to love addiction, workaholism, dependence on particular food and a healthy lifestyle.

KEY WORDS: coronavirus infection; COVID-19; doctors; occupational stress; quality of life; addictions.

ПРОБЛЕМА ПРОФЕССИОНАЛЬНОГО СТРЕССА ПЕДИАТРОВ В УСЛОВИЯХ ПАНДЕМИИ

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РЕЗЮМЕ. Важным последствием пандемии новой коронавирусной инфекции COVID-19 стало снижение качества жизни медицинских работников. Множество исследований констатировали наличие у медицинских работников эмоциональных и физических проблем, появившихся в результате перегрузок и сильного стресса в период борьбы с коронавирусом. В данной статье описаны результаты опроса медицинских работников на предмет ведущих факторов профессионального стресса в период пандемии, выделены актуальные стратегии преодоления профессионального стресса, которые отмечали сами респонденты, и проведен анализ наиболее ценных для них факторов в профессиональной деятельности, помогающих преодолевать стресс В рамках исследования также была проведена оценка эмоционального состояния и качества жизни сотрудников ковидного отделения, уровня проявлений у них различных симптомов профессиональной дезадаптации и склонности к формированию зависимого поведения. В проведенном исследовании приняли участие сотрудники отделения для детей, больных новой коронавирусной инфекцией COVID-19: врачи отделения, средний и младший медицинский персонал. Более половины респондентов упомянули факторы профессиональной дезадаптации, среди которых в основном физическое недомогание и некоторые эмоциональные проблемы. Сотрудники отделения отметили необходимость пересмотреть график работы для снижения усталости и выделили различные наиболее значимые для себя факторы в работе, которые могут помочь преодолевать трудности и стресс. Снижение показателей качества жизни выявлены у 38,5% врачей и 52,4% среднего медицинского персонала. У 62% респондентов выявлена выраженная склонность к различным зависимостям, в большей степени к любовной зависимости, трудоголизму, зависимости от пищи и здорового образа жизни.

КЛЮЧЕВЫЕ СЛОВА: коронавирусная инфекция; COVID-19; врачи; профессиональный стресс; качество жизни; зависимости.

According to the World Health Organization (WHO), viral diseases pose a serious public health challenge. Experts note the need for organizational measures to create conditions for providing assistance in the context of COVID-19, especially in the presence of concomitant diseases [4, 11]. According to many studies, the pandemic did not reveal specific features, but only aggravated problems in the healthcare environment: insufficient prestige of the profession, instability and insufficient wages, lack of support both from management at various levels and from patients, relatives and society as a whole. Additionally, one can highlight the fear of criminal prosecution and problems with prescribing the correct treatment in the absence of some of the necessary drugs and lack of time, as well as constant overwork [3].

A special problem is providing care to children with coronavirus infection in a hospital setting. According to WHO data, most children and young adolescents are ill in asymptomatic and mild forms, however, in severe forms of the disease, as well as for children with concomitant pathologies, various complicated forms of the disorder are characteristic. According to different sources, in 2020–2021 in the Russian Federation, COVID-19 was diagnosed in 7,6–8,6% of children [5, 10]. The illness is especially severe in young children, as well as in the presence of concomitant pathologies [4, 5]. Yu.S. Aleksandrovich and co-authors noted the difficulties of treatment in the absence of clearly effective treatment protocols, the need to take into account the individual characteristics of the child's disease and the lack of reliable data on the effectiveness and safety of specific drugs [1].

The stressful nature of the work of doctors during a pandemic is noted not only in national medicine. According to studies in various countries, from 8,9 to 50,7% of health workers

reported symptoms of depression, from 18,1 to 44,7% experienced anxiety, sleep disturbances were noted by 21,9–36,1% of respondents, excessive exposure to stress — from 6,6 to 71,5%, symptoms of post-traumatic stress disorder — from 7,7 to 49,5% of doctors. 36,0% of medical personnel had subthreshold mental health disorders, 34,4% had mild disorders, 22,4% had moderate disorders, and 6,2% had severe disorders [10].

According to an anonymous national survey of physicians and nursing staff, almost 30% of specialists working directly with coronavirus patients are close to dismissal due to fatigue, and 37% have health problems due to emotional exhaustion. Another 58,1% responded that they "go to work with interest, but are generally tired", 27,7% of doctors from "red zones" and 31,9% of nurses working with them "often think about dismissal" due to fatigue and overload or "close to it", 29,3% of medical workers note the presence of moderate and severe anxiety, and 8,3% — symptoms of moderate and severe depression according to the Beck Depression Inventory; 6,7% noted the presence of suicidal ideations; 35% recorded a high level of emotional exhaustion. Almost 42% of respondents in this group said that managers do not support them financially or emotionally, and they do not feel supported by their superiors. Practically all medical workers surveyed believe that their fatigue affects their patients; they note an excessively large amount of work and difficult working conditions, and the need to work without taking off a protective suit. At the same time, what upsets the staff most is the "indifference of management" [7].

According to research by O.A. Ovsyanik, the main problems of working in the conditions of the pandemic are related to changes in the usual rhythm of life and the inconvenience from the forced wearing of personal protective equipment (sweating glasses, diapers, lack of individualization due to suits, etc.). A condition of severe depression was reported by 28,6% of people, while anxiety about working during a pandemic is typical for 21,4% of medical workers, 85.7% worry about the health of their relatives, 60% worry about the health of patients, and about changes in the epidemiological situation in the city — 61,4%. Anxiety is more common among physicians aged 35–40 years, and least common among doctors aged 50–60 years. Specialists with extensive work experience and who are accustomed to taking reasonable risks in the workplace view the pandemic situation as a whole positively, as regular and surmountable. A.B. Kholmogorova also believes that the risk group is represented, first of all, by medical workers who are unsure of their professionalism and have not realized themselves as specialists, according to her data, and 54,7% of doctors name as factors of distress the anxiety for family members and 38,3% — fear of infection [9].

RESISTANCE TO STRESS FACTORS

According to O.A. Ovsyanik, as typical ways to relieve stress, 58,6% of doctors indicated alcohol, 51,4% — sleep, 47,1% — smoking, the use of sedatives was named by 31,4% of respondents, sports — 17,1% (more typical for young physicians) [6]. Doctors use the familiar to them stereotypical methods of relieving tension.

On researches of A.V. Aleshicheva, a comparative analysis of the indicators of doctors of 13 different specializations working during the pandemic, revealed that pediatricians are less prone to manifestations of pathopsychological symptoms (in particular, a tendency to phobic experiences, more typical for medical professionals of other specializations), have lower levels of depression and regularly use moderate physical activity (fitness, yoga, running, dancing, nordic walking) [2].

THE PROBLEM OF PROVIDING ASSISTANCE TO DOCTORS DURING A PANDEMIC

On the one hand, medical workers admit that they regularly receive social benefits, have extended insurance guarantees, and note the help of students of medical colleges and universities and volunteers. However, they draw attention to the need of the population and the state for greater social respect for representatives of their profession, in particular "increasing public respect for the profession", "thank you posters, articles and stories" about doctors [9]. The quality of support from relatives, colleagues and administration helps medical personnel maintain a sense of the significance of their profession and

self-respect as a professional [12]. These results are confirmed by our previous study [6].

According to the results of a survey of Russian doctors, 87,7% believe that medical workers providing care to patients with COVID-19 need psychological support [10]. At the same time, various programs of psychological assistance to healthcare professionals that appeared at the beginning of the pandemic turned out to be of little demand. Doctors themselves are used to controlling the situation and believe that they know how to cope with it. The need of physicians for psychological help is recognized by 90% of respondents, while the majority are skeptical about individual work with a psychologist, pointing to a lack of time and preferring the usual self-control and the use of pharmacotherapy, and doctors view a psychologist more as an assistant in helping patients and their relatives [8, 9]. As the study showed, improving working conditions could help cope with fatigue and burnout: "comfortable staff rooms", "the opportunity to comfortably eat and relax during breaks", as well as reducing workloads, providing staff with more effective protective equipment, measures to reduce the level of physical discomfort associated primarily with the use of personal protective equipment and lack of sleep. Physicians also need to carry out measures for psychological relief, explain to staff the meaning of all measures and decisions taken and collegial discussion of the organization of work.

The correlation between statistical indicators confirms the importance of organizational measures. The doctors surveyed consider the following to be the main resource for psychological well-being: provision of personal protective equipment in the workplace — 92,9%; support from relatives and friends — 78,6%; management support — 61,4%; decent attitude of society — 25,7%; material support — 22,9%; physical activity — 19.3% and legal support — 11,4% [9]. The organizational factors that reduce the level of distress were identified, first of all: information from management about the current situation and tasks; support from family and colleagues; financial incentives and the opportunity to take rest breaks.

After the pandemic, professionals would like to return to their usual duties and work in an area where they are more competent. They don't think that the pandemic has changed them in any way; they consider their attitude to work as usual. Perhaps such an assessment is associated with denial of the problematic situation and reluctance to acknowledge existing personal difficulties.

MATERIALS AND METHODS

Employees of the department for children with the new coronavirus infection COVID-19: ward doctors (n=13), nurses (n=21) and junior medical staff (n=7) took part in the survey. For psychological diagnostics were used: the Hospital Anxiety and Depression Scale (HADS); the questionnaire for the assessment quality of life SF-36; the questionnaire for the assessment of the manifestations of professional maladaptation O.N. Rodina; methodology for diagnosing the tendency to 13 types of addictions G.V. Lozovaya; author's questionnaire for occupational stress N.V. Kozina and A.V. Lakomskaya. The results were processed using the statistical application package SPSS Statistics (version 17.0). Descriptive statistics and the nonparametric Mann–Whitney U test for independent samples were used to analyze the results. Quantitative data are presented depending on the normal distribution as M±SD.

RESULTS

The new coronavirus infection COVID-19 pandemic has made significant adjustments to the work of doctors, challenging their adaptive capabilities. In the new conditions, medical workers were faced with a strong and prolonged exposure to the external environment, which could not but affect a person's attitude towards their work and profession as a whole.

As part of the socio-demographic survey, respondents were asked to answer open-ended questions that were focused on research into occupational stress factors during the pandemic and comparison of this experience with work in the pre-COVID-19 period. The questions were also aimed at identifying coping strategies that are relevant for health workers and at the most significant conditions in professional activity that help overcome occupational stress.

In the group of doctors, among occupational stress factors that cause the greatest distress during the pandemic, the majority of respondents point to a large amount of paperwork,

increased workload, rudeness of patients' parents, as well as the difficulties of interaction within the team at the time of a pandemic. Outside of work, specialists are forced to allocate time to plan and organize the next working day and analyze the characteristics of the patients' condition. Compared to past work experience they indicate at the moment a change in position and an increase in workload. Compared to their colleagues, they rate themselves as more balanced.

As coping strategies, physicians indicate in the questionnaire exclusively passive forms of recreation, mainly with the family, ignoring the importance of moderate regular physical activity for maintaining both physical and mental health and improving the quality of life [2]. To create the most comfortable environment at work, experts note the need to carry out activities aimed at team unity, assistance and peace of mind from management. Respondents also point to the need to reduce paperwork.

Doctors consider changing a work schedule or changing specialty to be significant factors in overcoming stress. Most of the subjects are satisfied with the wage and the work team, while the need to carry out activities aimed at improving interaction in the team, with management and parents of patients with the help of a full-time psychologist is noted.

In the group of nursing personnel, among the occupational stress factors that cause the greatest distress during the pandemic, most respondents note an increase in workload and increased demands (both volume and complexity of work), as well as problems in organizing the work process, poor working conditions, unstable schedule, including difficulties in distributing duties during a work shift at the time of a pandemic, increased personal responsibility for work results. In addition, workers point out the rudeness of patients' parents and the difficulty of constantly working in personal protective equipment. Employees tend to analyze problematic aspects of the past working day. Compared to past work experience, they currently note positive changes: mastering new specifics of work, obtaining more skills and professional experience, career growth, increasing the efficiency of their work, as well as increasing wages; they assess themselves as balanced and capable of overcoming stress.

Among the strategies that help cope with stress, the majority of nursing staff prefer active forms of recreation (walking, sports, etc.), are aware of the need for a healthy lifestyle, but at the same time note the presence of certain difficult work shifts, after which they capable only of passive forms of life activity, prone to "emotional eating". They believe that to create the most comfortable environment at work, it is necessary to improve interaction with management (discussion of mistakes, help, understanding), as well as reorganize the work schedule for the purpose of a more orderly distribution of responsibilities, carry out activities aimed at uniting the team and improving working conditions for most comfortable work.

Among the significant factors for overcoming stress, nurses include the opportunity for career growth, improving the quality of their work and satisfaction with it, and the most significant factors are teamwork and stability of wages.

In the group of junior medical personnel, among the occupational stress factors that cause the greatest distress during the pandemic, those associated with various social restrictions (inaccessibility of some public places, inability to travel, the need to use personal protective equipment, etc.) were identified. Most subjects indicate an increase in workload. Employees are little inclined to analyze work situations and problems, and if they think, it's about the mistakes they've made. Compared to work in the pre-COVID-19 period, they indicate significant changes in the specifics of activities in the given workplace, and rate themselves as calm, patient, fast, reasonable.

Staff note the presence of difficult working days, accompanied by a decrease in activity, after which they require recuperation. Both active and passive forms of recreation are used to maintain good health.

Among the significant factors influencing overcoming stress, the majority of subjects indicate that they are satisfied with the organization of work, they would not like to change anything, and are generally satisfied with the work team. Nevertheless, they note the need to carry out activities aimed at improving interaction in the team. Many are interested in career growth.

Summarizing the results of the qualitative analysis of the questionnaires, the following points should be highlighted:

- The majority of respondents are satisfied with the work team, but at the same time

indicate the need to carry out activities aimed at uniting the team, including with the help of a psychologist.
- There is a need to improve relationships with management, more interaction and support from senior employees.
- It is necessary for doctors to create activities that allow them to develop active forms of recreation and stress relief, including during working hours. A joint analysis of work schedules and assistance in creating algorithms for filling out documentation is possible.
- For nursing personnel, reorganization measures are recommended to ensure a more streamlined distribution of responsibilities.

As part of the psychodiagnostic block of the study, respondents were asked four questionnaires. As the group of junior medical personnel turned out to be the smallest and, according to the methods used, its employees demonstrated the most favorable results, these data were not included in the description of the results of the psychodiagnostic examination.

According to the questionnaire for assessing manifestations of professional maladjustment**,** a statistically significant difference was found between the groups of doctors and nursing staff only on the scale "violation of the cycle sleep-wake" (Table 1). Doctors more often and to a greater extent than nurses report complaints of lack of sleep and problems associated with it. However, it is important to note that, for the overall indicator, both groups of department employees have a moderate level of maladjustment, which characterizes risk groups.

A moderate level of manifestations of maladjustment is typical for 53% of doctors, and 15% showed a pronounced level of maladaptation, which undoubtedly requires the help of specialists and the organization of various measures to overcome stress. Professional maladjustment among physicians is more often manifested by signs of asthenia: sleep disorders, fatigue, and decreased general activity.

Among nursing personnel, 33% have a moderate of professional maladaptation and 19% have a pronounced level of professional maladjustment, which manifests itself in deterioration of health, as well as emotional lability, low mood and disruption of social interaction.

The complexity and intensity of the work of medical workers during the pandemic could not but affect their quality of life. Based on the results of a comparative analysis of data from the SF-36 questionnaire for the assessment quality of life, no statistically significant differences

Table 1

Questionnaire data for assessing the manifestations of professional maladaptation O.N. Rodina

Таблица 1

Данные опросника для оценки проявлений профессиональной дезадаптации О.Н. Родиной

Scales / Шкалы	**Doctors / Врачи**	**Nurses / Медсестры**
Emotional shifts / Эмоциональные сдвиги	5,15±4	6,4±4,5
Features of individual mental processes / Особенности отдельных психических процессов	1,85±2	2,3±1,9
Decreased overall activity / Снижение общей активности	3,85±2,4	4,05±1,9
Feeling tired / Ощущение усталости	5,08±3,5	5,4±3,3
Somatovegetative disorders / Соматовегетативные нарушения	11,62±8,7	9,48±8
*Violation of the cycle sleep-wake / Нарушение цикла сон–бодрствование	**9,23±2,9***	**6,29±2,8***
Features of social interaction / Особенности социального взаимодействия	5,62±4,2	5,81±3,8
Decreased motivation to work / Снижение мотивации к деятельности	2,69±2,25	3,48±1,9
General indicator of maladaptation / Общий показатель дезадаптации	45,08±23,9	43,19±21,1

* $p \leq 0,01$.

Table 2

Comparative analysis of quality of life indicators

Таблица 2

Сравнительный анализ показателей качества жизни

Health Status Survey SF-36 / Опросник качества жизни SF-36		
Scales / Шкалы	Doctors / Врачи	Nurses / Медсестры
Physical Functioning — PF / Физическое функционирование	93,1±8,3	88,3±19,6
Role-Physical Functioning — RP / Ролевое функционирование, обусловленное физическим состоянием	**63,5±36,2**	73,8±36,6
Bodily pain — BP / Интенсивность боли	70,4±26,2	71,5±22,4
General Health — GH / Общее состояние здоровья	**66,3±18,8**	**55,5±17,3**
Vitality — VT / Жизненная активность	**55,4±22,9**	**52,4±19,9**
Social Functioning — SF / Социальное функционирование	70,2±26,8	**67,3±19,9**
Role Emotional — RE /Ролевое функционирование, обусловленное эмоциональным состоянием	82,05±29,2	76,2±26,1
Mental Health — MH / Психическое здоровье	**60,6±20,6**	**53,3±21,5**

Note: bold font shows decreased indicators among respondents that are significant for qualitative analysis; they are then interpreted in the text.
Примечание: жирный шрифт демонстрирует сниженные у респондентов показатели, значимые для качественного анализа, далее они интерпретируются в тексте.

were identified between the groups of doctors and nursing staff, which may indicate an identical assessment of the department's employees' own quality of life (Table 2). Quality of life indicators were assessed on a scale from 0 to 100, with low values below 51 points. During the qualitative analysis of the data, respondents were noted in whose results three or more scales for assessing the quality of life had low scores. There were 38,5% of such respondents among doctors, and among nursing staff — 52,4%.

Among physicians, a decrease is more often detected on the "role-physical functioning" scale, which indicates a significant limitation in the performance of daily activities (work, daily household duties) due to the physical condition of respondents, which is also associated with a decrease on the "general health" scales and indicates about doctors' low assessment of their health status at the time of the study. The "vitality" and "mental health" scales, included in the block of the psychological component of health, stand out for their low values, which may indicate the fatigue of doctors and a general decrease in their vital activity, as well as characterize the presence of depressive, anxiety and mental distress. The data obtained may be related to the intensity and complexity of the work and may be expressed, among other things, in the professional maladaptation described above.

Analysis of data in the group of nursing staff shows a greater reflection of negative influences on the component of psychological health, including a decrease not only in the "vitality" and "mental health" scales, as in doctors, but also in the "social functioning" scale. Low values in this context reflect a significant limitation of social contacts in the group of healthcare workers, a decrease in the level of communication due to the deterioration of physical and emotional condition.

According to the Hospital Anxiety and Depression Scale (HADS) (Table 3), with normative data among nursing personnel, 19% have a subclinical level of anxiety, and 19% have a clinical level of anxiety and a severe anxious clinical picture. In the group of doctors, 23% show subclinical values. The data obtained are comparable with studies of other authors, for example A.B. Kholmogorova et al. [12]. An interesting fact is that, despite the small number of respondents demonstrating emotional distress in the formal questionnaire, in the open-ended questions of the questionnaire, most of them noted such negative emotional experiences as irritability, low mood, and fatigue.

As is known, experiencing stressful situations and prolonged negative external influences often provoke the launch of psychological defense mechanisms in order to return a person to a state of peace and a sense of psychological

Table 3

Hospital Anxiety and Depression Scale

Таблица 3

Данные госпитальной шкалы тревоги и депрессии

Respondents / Респонденты	Anxiety / Тревога	Depression / Депрессия
Doctors (n=13) / Врачи	6,8±3,4	6,3±3,3
Nurses (n=21) / Медсестры	8,2±4,3	6,1±3,2

safety. In order to achieve a state of psychological comfort, not the most productive methods, for example, the formation of addictive behavior, are often chosen. Addicted behavior is manifested by a persistent desire to change the psychophysiological state and, despite the different objects of addiction, forms of addiction have a similar psychological mechanism of formation. Since the specific nature of the work of health professionals involves a high level of stress and the risk of emotional burnout, the likelihood of addiction also increases.

According to the methodology for diagnosing the tendency to form addictions, 62% of respondents in each group have an average degree of general tendency to develop addictions (Fig. 1). The absence of statistically significant differences between groups of medical workers allows us to describe the results of general trends. The highest degree of predisposition manifests itself in love addiction (dependence on relationships with fixation on another person). In these relationships, a disproportionate amount of time and attention is given to the significant person, down to symbiotic attachment. Food addiction is also expressed (an eating disorder in which food is used as a means of escaping subjective reality). During stress, there is a desire to "eat" trouble. This is possible because fixation on taste sensations occurs and unpleasant experiences are repressed. Among other things, health workers tend to become dependent on work and a healthy lifestyle.

Work addiction can manifest itself in the quest to fixate on work situations; "going to work" becomes a way of avoiding concentration on current problems. One of the important features of work dependence is the irresistible desire for constant success and approval from others, combined with the fear of failure, being incompetent, and showing unprofessionalism in the eyes of colleagues and superiors. Workaholism not only stimulates stress, but also alienates from family and friends, increasing the degree of their own experiences.

Dependence on a healthy lifestyle can be expressed in excessive importance and focus on the health problem, which dominates the life values and interests of the individual. The overvalued nature of this orientation can manifest itself in various forms: in the desire for greater

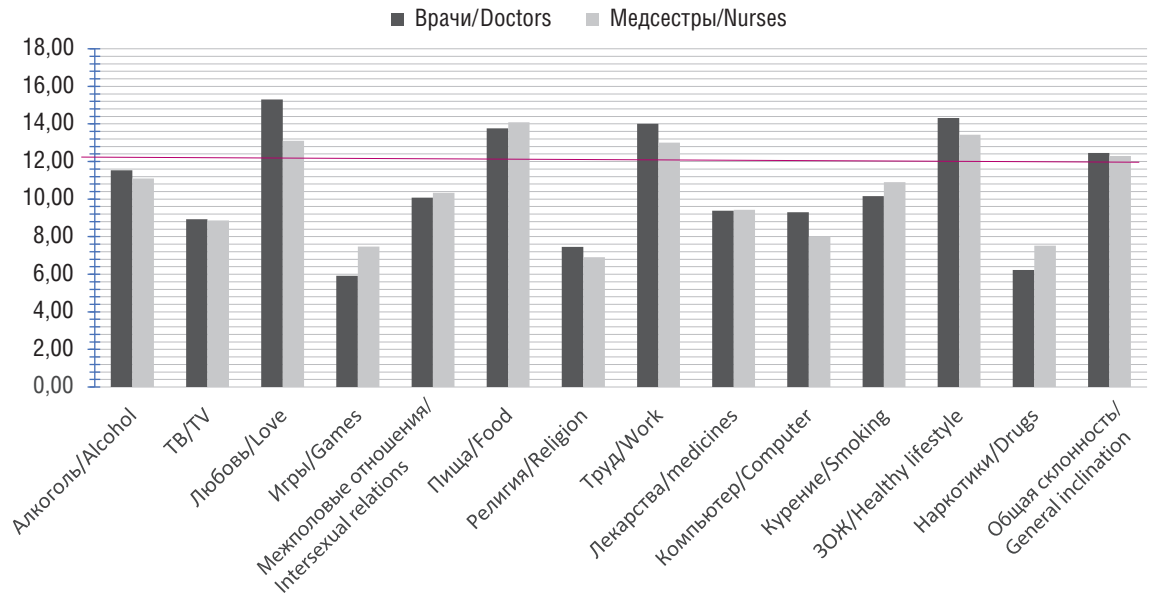

Fig. 1. Data for diagnosing the tendency to form addictions

Рис. 1. Данные диагностики склонности к формированию зависимостей

awareness of health issues, the formation of strict attitudes regarding the individual picture of ideas about a healthy lifestyle (one's own and those of loved ones), and also in understanding the need to take care of health if it is impossible to implement it in this period.

It is important to take into account the fact that high scores in this questionnaire only reflect a tendency to develop addictive behavior.

CONCLUSION

1. According to the survey results, the majority of respondents noted the need to revise the work schedule, streamline the mode of work and rest, and the desire for more intensive interaction with management and support from them. Among the significant factors helping to overcome stress, respondents indicated active forms of recreation, satisfaction with wages, communication in a team and the opportunity for career growth. The following were noted as proposals for qualitative changes: organizing activities to unite the team, improving relations with management and parents of patients with the involvement of a full-time psychologist in solving these problems, as well as discussion and some reorganization of working conditions for the most comfortable in work.

2. More than half of the surveyed medical personnel noted factors of professional maladjustment. Among doctors, symptoms of physical ailment (lack of sleep, loss of strength, etc.) are more common, while nursing staff, in addition to physical symptoms, note the manifestation of maladaptive factors in the emotional sphere and social interaction.

3. Low values of more than three quality of life indicators were detected in 38,5% of physicians and 52.4% of nursing personnel. Respondents in both groups showed the lowest indicators of general health, vitality and mental health; nurses also showed a decrease in social functioning and an increased level of anxiety. These employees interact more frequently and intensively with patients during their professional activities and report impairments in social functioning.

4. All medical workers noted the high stress level of their work and the need to relieve tension. Various methods of achieving psychological comfort that are accessible and socially approved can act as a coping mechanism: delicious food, watching movies, going to the gym. However, shifting the focus from solving current problems to finding ways to regulate mood in order to restore emotional comfort ultimately does not help to understand problems and stressful situations, and can become a form of dependence. 62% of respondents have a pronounced tendency to various addictions, to a greater extend to love addiction, workaholism, dependence on food and a healthy lifestyle.

The extreme working conditions of medical workers during a pandemic require them to have a high degree of mobilization and dedication. Additional difficulties arise and working conditions become more complicated. Considering the high danger and prevalence of the new coronavirus infection, as well as the limited knowledge about it, it is necessary to study all aspects of the new disease to develop preventive measures, diagnostics, patient management strategies, disinfection, and rehabilitation measures.

The resolution of this problem depends on the ability of management and the specialists themselves to make mature and rational decisions, as well as on the introduction of special trainings and programs (both face-to-face and remote) that are designed to help health workers overcome the difficulties of psychological tension.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

Competing interests. The authors declare that they have no competing interests.

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ASSESSMENT OF TUBERCULOSIS RELAPSES DURING THE NEW CORONAVIRUS INFECTION PANDEMIC

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ABSTRACT. With the pandemic of a new coronavirus infection, the relevance of tuberculosis as a disease is not diminished. Against the backdrop of the pandemic, deaths from TB are predicted to increase for a number of reasons, one of them being an increase in early and late relapses, which are important in the epidemiology of TB. This is due to the fact that relapses of respiratory TB are much more severe and characterized by more severe clinical and radiological manifestations of the disease compared to the newly detected process. The causes of relapses remain poorly understood. During the study, the outpatient records of 122 patients who were observed in SPB PTD 8 during 2013–2022 were studied. The social status of the patients varied, allowing them to be divided into three groups: homeless persons, other socially maladapted persons with registration in the Central District, and socially adapted persons. The socially adapted comprised 44% and the socially disadapted 66%, including homeless people, who comprised 59% of all socially adapted and 33% of all those surveyed. The incarceration rate was 25%. There was a significant aggravation in the structure of diagnoses after relapse, with a shift towards forms of tuberculosis prone to progression and generalization, with a predominance of destructive forms and increase in drug resistance. Almost absent among relapses was a favourable form such as focal tuberculosis, which was in second place in the structure of diagnoses before relapse. Disseminated tuberculosis occupied this place in the structure of post relapse diagnoses. Among relapses in individuals who had had a new coronavirus infection, early relapses predominated. The leading place in structure of concomitant pathology in investigated patients with relapses belonged to diseases of cardiovascular system and chronic nonspecific lung diseases.

KEY WORDS: tuberculosis; tuberculosis relapses; new coronavirus infection; homeless persons.

ОЦЕНКА РЕЦИДИВОВ ТУБЕРКУЛЕЗА В УСЛОВИЯХ НОВОЙ КОРОНАВИРУСНОЙ ИНФЕКЦИИ

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РЕЗЮМЕ. В условиях пандемии новой коронавирусной инфекции актуальность туберкулеза как заболевания не снижается. На фоне пандемии прогнозируется рост смертности от туберкулеза в силу ряда причин, одной из которых является рост числа ранних и поздних рецидивов, имеющих важное значение в эпидемиологии туберкулеза. Обусловлено это тем, что рецидивы туберкулеза органов дыхания протекают значительно тяжелее и характеризуются более тяжелыми клинико-рентгенологическими проявлениями заболевания по сравнению со впервые выявленным процессом. Причины рецидивов остаются недостаточно изученными. В ходе исследования были проанализированы амбулаторные карты 122 пациентов, наблюдавшихся в СПб ГБУЗ ПТД № 8 в течение 2013–2022 гг. Социальный статус пациентов был различен, что позволило разделить их на три потока: лица без определенного места жительства (БОМЖ), другие социально дезадаптированные лица, имеющие регистрацию в Центральном районе, и социально адаптированные лица. Социально адаптированные составили 44%, социально дезадаптированные — 66%, включая лиц БОМЖ, составлявших 59% от всех социально дезадаптированных и 33% от общего числа всех обследованных. В местах лишения свободы находилось 25% пациентов. Отмечалось значительное утяжеление структуры диагнозов после рецидива, со сдвигом в сторону склонных к прогрессированию и генерализации форм туберкулеза, с преобладанием деструктивных форм и ростом лекарственной устойчивости. Среди рецидивов практически отсутствовала такая благоприятная форма, как очаговый туберкулез, находившийся на втором месте в структуре диагнозов до рецидива. Данное место в структуре пострецидивных диагнозов занял диссеминированный туберкулез. Среди рецидивов у лиц, перенесших новую коронавирусную инфекцию, преобладали ранние рецидивы. Ведущее место в структуре сопутствующей патологии у обследованных больных с рецидивами принадлежало заболеваниям сердечно-сосудистой системы и хроническим неспецифическим заболеваниям легких.

КЛЮЧЕВЫЕ СЛОВА: туберкулез; рецидивы туберкулеза; новая коронавирусная инфекция; лица БОМЖ.

INTRODUCTION

The most significant epidemic of the beginning of the XXI century, which erupted in 2020 and continues to this day, is associated with the spread of the SARS-CoV-2 virus, which causes a new coronavirus infection, has not made less relevant the oldest chronic infectious disease, which has coexisted with humanity for millennia, but namely tuberculosis. The World Health Organization (WHO) documents emphasize: "Tuberculosis is preventable and curable. About 85% of people who develop TB disease can be successfully treated with a 4/6-month drug regimen; treatment has the added benefit of curtailing onward transmission of infection" [13]. However, the COVID-19 pandemic may reverse the progress achieved in the fight against tuberculosis [5]. WHO estimates that 10.6 million people worldwide fell ill with tuberculosis in 2021, an increase of 4,5% from 2020, and 1,6 million people died from tuberculosis (including 187,000 among HIV positive people). The burden of drug-resistant tuberculosis also increased by 3% between 2020 and 2021. This is the first time in many years an increase has been reported in the number of people falling ill with TB, including drug-resistant tuberculosis, as noted in a WHO press release dated October 2022 [35]. There is growing evidence that tuberculosis is closely associated with unfavorable outcomes from COVID-19, including an approximately two- to three-fold increase in patient mortality, as well as a 25% decrease in recovery rates [2, 22, 24, 29, 36].

According to mathematical modeling, the forecast for the period from 2020 to 2025 is that, as a direct impact of the COVID-19 pandemic, the incidence of tuberculosis could increase by more than 1 million new cases per year, and mortality by 1,4 million people [28, 34].

Tuberculosis has long been one of the top ten leading causes of death worldwide and is the third leading cause of death among women in the Russian Federation aged 25–34 years [18, 27, 33]. In our time, the new coronavirus COVID-19 infection, being in first place among the causes of mortality from infectious diseases, has pushed tuberculosis to second place in this list [3]. Against the backdrop of the pandemic, deaths from TB are predicted to increase for a number of reasons. These include the following:

- delayed detection due to low patient attendance because of anti-epidemic measures against COVID-19 [26];
- temporary conversion of TB healthcare facilities into COVID-19 hospitals;
- refusal of patients with suspected and confirmed tuberculosis to contact phthisiatricians due to fear of a new coronavirus infection;
- activation (relapses) of tuberculosis infection in persons who have had tuberculosis or have latent tuberculosis infection [19];
- the challenge of diagnosing TB infection, since the diagnosis of tuberculosis, verified under normal conditions only in 80% of cases, can be even more difficult during a pandemic period [7, 31, 32];
- widespread use of immunosuppressive therapy in the treatment of new coronavirus infection, which leads to reactivation of tuberculosis;
- the difficulty detecting tuberculosis due to massive lung lesions during COVID-19, masking the initial manifestations of tuberculosis; in turn, latent or active tuberculosis may be a risk factor for SARS-CoV-2 infection [23]; according to foreign researchers, in approximately 20% of cases, COVID-19 occurred in patients with post-tuberculosis changes detected by X-ray [30].

The combination of COVID-19 and tuberculosis is registered in 0,3–8,3% of cases worldwide, more often in high tuberculosis burden countries (China and India) [19].

Since both new coronavirus infection and tuberculosis are infectious diseases characterized primarily by damage to the respiratory system, they can cause its dysfunction. The cellular immune response to *Mycobacterium tuberculosis* and SARS-CoV-2 is also similar, one of the important characteristics of which is the predominance of specific phagocytes and CD4+ T-lymphocytes. Chronic stimulation with SARS-CoV-2 virus antigens can cause T cell exhaustion in a person with a pre-existing tuberculosis infection, active or latent [25].

The latest version of the temporary guidelines Ministry of Health of the Russian Federation on the prevention, diagnosis and treatment of COVID-19 noted: “The consequences of infection with COVID-19 in patients with tuberculosis are not completely clear. There are scientific publications that the presence of tuberculosis infection, including latent, aggravates the course of COVID-19 <...> Tuberculosis can occur before, simultaneously or after COVID-19” [4].

Relapses in tuberculosis are important in the epidemiology of this chronic infectious disease. The causes of relapse remain poorly understood. The views of different researchers regarding the influence of certain factors on the development of relapse vary. A number of authors give priority to concomitant diseases in the reactivation of tuberculosis, others prefer the presence of large residual changes in the lungs [10, 12, 21]. And finally, many clinicians pay attention to the inferiority of the main course of chemotherapy for the first disease, believing that relapses of pulmonary tuberculosis more often occur in patients who received inadequate initial treatment [8]. However, the possibility of reinfection as a result of exogenous superinfection and the development of a new tuberculosis episode remains unexplored. Currently, clinical and social risk factors for pulmonary tuberculosis recurrence are being actively studied. Reactivation of tuberculosis is 1,8 times more likely to occur in disadvantaged groups and 2 times more often in patients suffering from chronic alcoholism [17]. The most significant risk factors for the occurrence of relapses of tuberculosis are: destructive forms of tuberculosis, inadequate therapy, late detection of the disease, males, concomitant pathology (HIV infection), incarceration [11].

The concept of relapse of pulmonary tuberculosis was officially formulated at the VII All-Union Congress of Phthisiologists (1966). The need to adopt this term arose in connection with the widespread use of specific chemotherapy and surgical treatment methods and caused by them loss of one of the characteristic features of tuberculosis — the undulation of the course, as well as with the emergence of the concept of “clinical recovery” [1]. In Russian literature,

the definition of "early" (up to five years after removing from the register) and "late" relapses were given in the works of V.L. Einis (1954) and A.E. Rabukhin (1957) [16, 20]. Until the mid-1990s, the leading role in the pathogenesis of secondary tuberculosis was assigned to endogenous reactivation of old foci (mainly in the lungs and lymph nodes) [1].

Relapses of respiratory TB are much more severe and are characterized by more severe clinical and radiological manifestations of the disease, reflected by severe or moderate intoxication syndrome, more often become chronic and lead to higher mortality compared to the newly detected process. Treatment of this category of persons turns out to be longer, more expensive and less effective [8]. Patients with relapses of pulmonary tuberculosis pose a great epidemic risk due to the massive bacterial excretion.

AIM

The aim of the present study an assessment of the X-ray picture of patients with relapses of tuberculosis in the work of a radiologist at the TB dispensary in a metropolis in the context of a new coronavirus infection.

MATERIALS AND METHODS

During the study, outpatient records (form No. 025/y) of 122 patients with relapses of tuberculosis, who were observed in St. Petersburg State Budgetary Institution of Health "TB Dispensary № 8" during 2013–2022, were examined. (selectively, part of the flow attributable to the work area of one radiologist), of which 84 were men and 38 women aged from 18 to 70 years. Among the patients there were both those who did not have COVID-19 (both before and during the pandemic) — 97 people (79,5%), and those who were sick with the new coronavirus infection — 25 people (20,5%).

The received information was entered into an electronic database using the software Microsoft Office Excel 2016. The work analyzed qualitative characteristics, which were presented in the form of absolute numbers (n) and extensive indicators (%). When performing interval assessments of extensive indicators, the 95% confidence interval (95% CI) was calculated using the Wilson method. Statistical processing of the results was carried out using analytical software IBM SPSS Statistics (version 20.0) for Windows. The reliability of differences between qualitative dichotomous characteristics in dependent samples was assessed when constructing contingency tables using the McNemar's test; a critical value of the significance level of $p \leq 0,05$ was used.

RESULTS AND ITS DISCUSSION

When analyzing the data obtained, the social status of the patients was first examined. The social status of the patients varied, allowing them to be divided into three groups: homeless persons, other socially maladapted persons with registration in the Central District, and socially adapted persons. The socially adapted comprised 44% and the socially disadapted 66%, including homeless people, who made up 59% of all socially maladjusted people and 33% of the total number of all those surveyed. The incarceration rate was 25% (80% of them were homeless people), and during the initial examination, half of the patients mentioned presence in a place of deprivation of liberty (which was reflected in the outpatient record), for the rest it was clarified later, by taking an anamnesis by a radiologist [6].

83% of those surveyed (including homeless people living with cohabitants or relatives, as well as renting housing), had permanent accommodation (own or rented) while 17% did not have any housing and lived in a night shelter and in shelters (only homeless persons). 65% had a permanent job. Those unemployed due to dismissal not on their own volition (enterprise bankruptcy, including during a pandemic) or layoffs were classified as socially maladapted, even if the earnings of their spouse or parents allowed them to lead an acceptable way of life and not to lack food. The number of pensioners was 10% (non-working pensioners — 2%), disabled people — 5% (disability in all cases was not related to tuberculosis). Among the patients with relapses were persons under the age of 25 years who had suffered forms of primary tuberculosis in adolescence (primary tuberculosis complex — 1 person, tuberculosis of the intrathoracic lymph nodes, complicated by foci of dropout into the lung tissue — 2 persons) and were removed from the register. All of these individuals developed infiltrative tuberculosis during relapse.

The majority of patients (97%) suffered from pulmonary tuberculosis, generalized tuberculo-

sis was found in 2% of cases, and one patient had extrapulmonary tuberculosis. All patients underwent a complex examination, including radiological examination, in particular chest X-ray and computed tomography of the chest organs (chest CT). In the examined groups, early relapses predominated, accounting for 82% of cases, while in the group of homeless people they amounted to 100%. The structure of clinical forms after relapses in the groups surveyed is presented in Figures 1 and 2.

As can be seen from Figure 1, among the diagnoses of patients with newly diagnosed tuberculosis, infiltrative tuberculosis had the largest share — 51%, focal tuberculosis was in second place (16%), tuberculosis of the intrathoracic lymph nodes and disseminated tuberculosis were in third place (9 and 8%, respectively). Destruction was observed in 44% of cases. After the cure, the residual changes of various types (fibrous, fibrous-focal, bullous-dystrophic, the presence of calcifications in the lung tissue and lymph nodes, pleuropneumosclerosis, pleural calcification) and extent (from one or two segments to a lobe or several lobes with unilateral or bilateral lung lesions) persisted.

Structure of diagnoses after relapses was as follows. As before, infiltrative tuberculosis, whose share was 65%, was in first place in the diagnosis structure. In second place was disseminated tuberculosis (17%), in third place was generalized tuberculosis (8%), and focal tuberculosis was found in 2% of cases. Destructive forms accounted for 70% of all those surveyed. Caseous pneumonia, cirrhotic tuberculosis and cavernous tuberculosis were not noted either as a primary

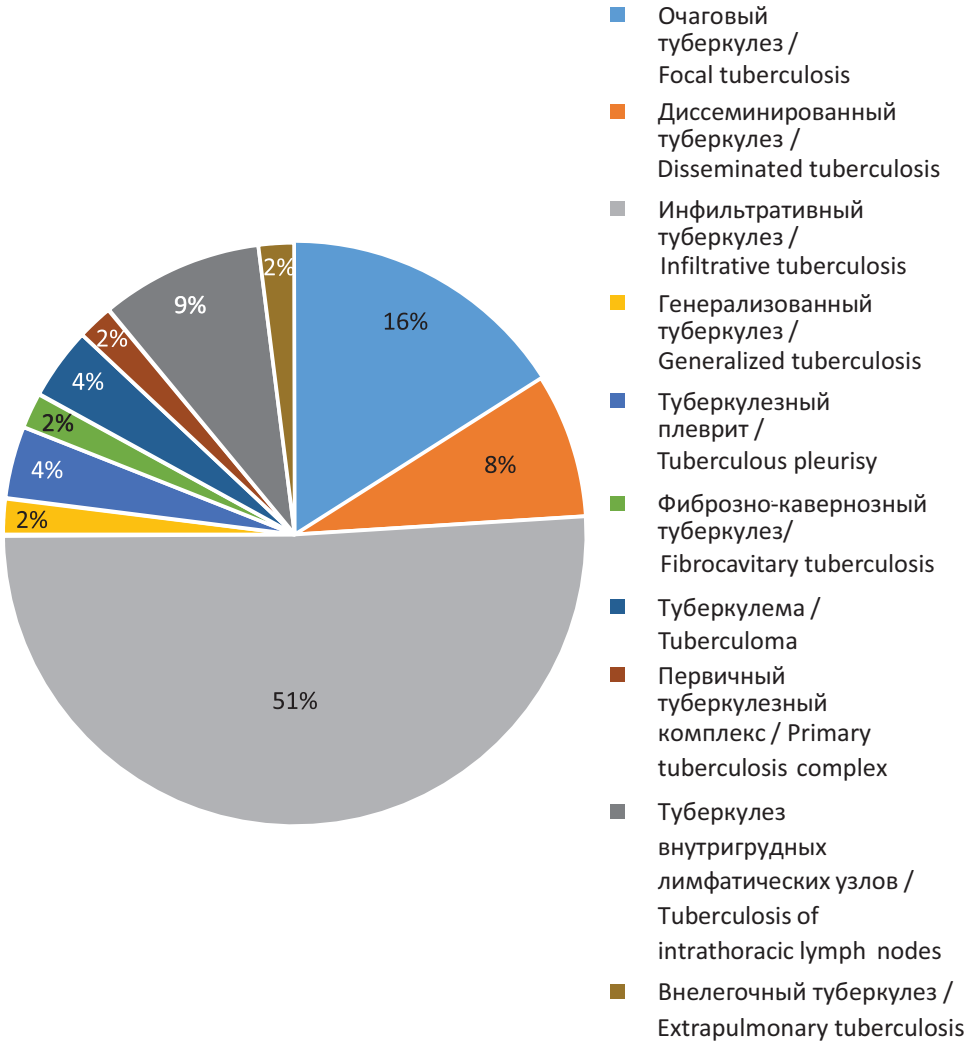

Fig. 1. Structure of diagnoses of newly diagnosed tuberculosis

Рис. 1. Структура диагнозов при впервые выявленном туберкулезном процессе

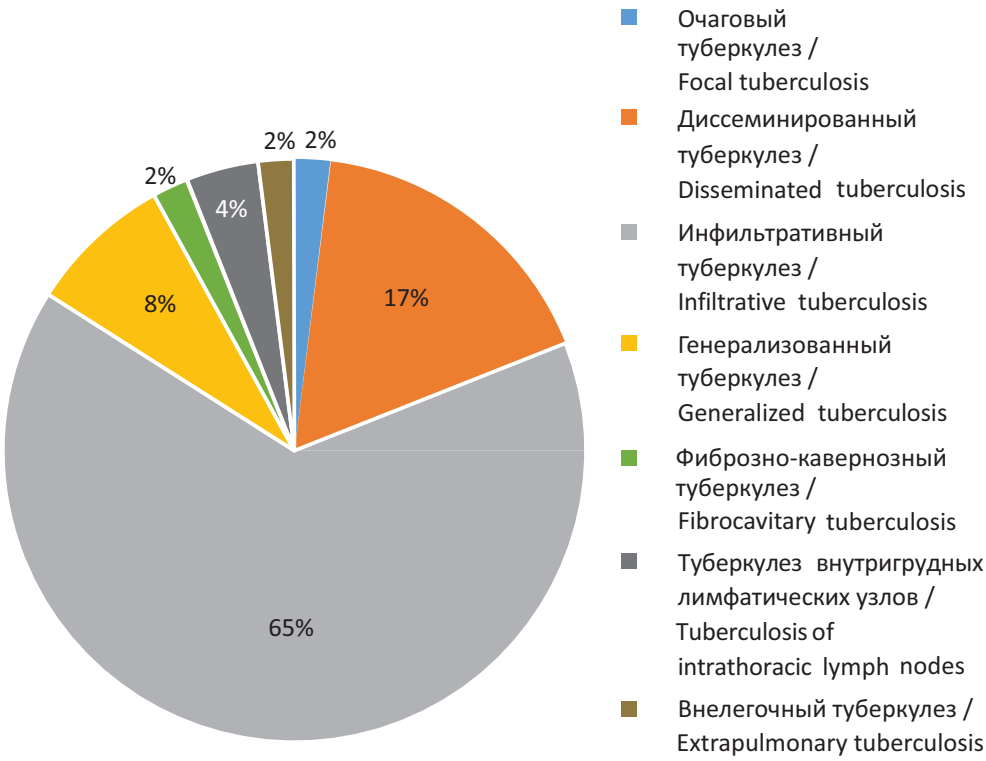

Fig. 2. Structure of diagnoses after relapses of tuberculosis

Рис. 2. Структура диагнозов при рецидиве

diagnosis or as a recurrence. In one person, a relapse of disseminated tuberculosis with decay and excretion of bacilli was diagnosed post-mortem (heroin-dependent, HIV-positive, without antiretroviral therapy (ART)); upon relapse, a diagnosis of generalized tuberculosis was established.

In 65% of patients, when the primary diagnosis was made, a limited TB process was detected within one lobe of the lung, a widespread process was detected in the remaining 35%, while 80% of them had unilateral localization, 20% had bilateral lung lesion. During relapse, the prevalence of the process in patients, as a rule, increased both due to the appearance of foci of dropout in the affected or opposite lung, and due to the development of disseminated and generalized forms. In the case of relapses, a limited TB process within one lobe of the lung was detected in 25% of patients, a widespread process was detected in 75%, while 60% of them had unilateral localization, and 40% had bilateral lung damage. The X-ray picture was characterized by the presence of exudative or productive foci, dissemination, infiltration of lung tissue with focal, limited or subtotal darkening syndromes, the presence of a decay cavity or cavities, cavity formation, a decrease in the volume of part of the lung, mediastinal widening, and signs of unilateral hydrothorax.

Drug resistance at primary diagnosis was determined in 24% of patients (multiple drug resistance (MDR)) — 18%, broad drug resistance (BDR) — 6%), and after relapse — in 29% (MDR — 17%, BDR — 12%).

Table 1 shows the distribution of the frequency of *M. tuberculosis* isolation with BDR in patients before and after relapse of tuberculosis.

In patients with tuberculosis, strains of *M. tuberculosis* with BDR were detected in 5.7% (95% CI 2.8–11.4) of cases before relapse and in 11.5% (95% CI 6.9–18.3) of cases after relapse of the disease. To assess the impact of the development of TB relapse on the frequency of *M. tuberculosis* isolation with BDR, two hypotheses were formulated: H_0 — TB relapse does not significantly affect the frequency *M. tuberculosis* of isolation with BDR, H_1 — TB relapse significantly affects the frequency of *M. tuberculosis* isolation with BDR. When calculating the McNemar test, the value of the statistic χ^2=7.0 exceeded the critical value of 3.8 for a given number of degrees of freedom

Table 2

Distribution of the frequency of *M. tuberculosis* isolation with broad drug resistance (BDR) in patients depending on the development of tuberculosis relapse

Таблица 1

Распределение частоты выделения *M. tuberculosis* с широкой лекарственной устойчивостью у пациентов в зависимости от развития рецидива туберкулеза

		After the tuberculosis relapse / После рецидива туберкулеза		
		Presence of BDR (n) / Наличие ШЛУ (n)	**Absence of BDR (n) / Отсутствие ШЛУ (n)**	**Total / Всего**
Before the tuberculosis relapse / До рецидива туберкулеза	Presence of BDR (n) / наличие ШЛУ (n)	7	0	7
	Absence of BDR (n) / отсутствие ШЛУ (n)	7	108	115
	Total / Всего	14	108	122

df=1, significance level p=0.009. This allows us to accept hypothesis H_1 and conclude that there is a statistically significant increase in the frequency of *M. tuberculosis* isolation with BDR in patients after relapse of tuberculosis.

Structure of diagnoses of concomitant pathology. One of the important factors contributing to the development of relapse of respiratory TB is concomitant pathology [1]. The leading place in the structure of concomitant pathology in the investigated patients with relapses belonged to diseases of the cardiovascular system and chronic nonspecific lung diseases (51 and 49%, respectively; in the group of socially adapted patients these values were equal to 66 and 78%, respectively, and in the group of maladapted individuals they were 20 and 48%). Moreover, these socially disadapted persons had concomitant pathology that was absent in socially adapted patients (viral hepatitis — 10%, drug addiction — 5%, alcoholism — 8%). HIV infection was observed in 5%. Of the HIV-positive patients with recurrent tuberculosis, none received ART regularly; There was no ART in 25% of people with HIV. Patients with a combination of HIV infection and tuberculosis are observed in a special center to care for such persons, and therefore they less often come to the attention of the TB dispensary.

Of all patients, 20.5% (25 people) suffered a new coronavirus infection, among them socially adapted ones prevailed (88%). A larger proportion of socially adapted individuals was associated with a more attentive attitude to their health and independent access to PCR testing; in socially maladjusted individuals, the disease was detected after hospitalization with 25–50% lung damage and above. All patients who had a new coronavirus infection were examined, including a computed tomography scan of the chest, of which 65% were hospitalized. Lung lesions after coronavirus infection were distributed as follows: the absence of signs of viral pneumonia on chest CT was noted in 12% of patients, a characteristic picture of areas of compaction of the lung tissue by type “ground-glass opacity” and interstitial changes, occupying up to 25% of the lung tissue, was observed in 46% patients, damage to 25–50% of lung tissue — in 34%, damage to 50–75% of lung tissue — in 8% of patients. Lesions of more than 75% were not found among the examined group. Early relapses were predominated among those who had a new coronavirus infection (earlier than 5 years after removing from register at the TB dispensary) — 78%. There were 24% of patients with late relapses, all of them were socially adapted, 83% of them were women who went to the tuberculosis dispensary on their own, concerned that the new coronavirus infection would affect their health. Large residual changes were occured only in 35% of all individuals who had a relapse after suffering a new coronavirus infection, the rest had small residual changes. In the structure of diagnoses after relapses, infiltrative tuberculosis prevailed (80% had infiltrative tuberculosis, 16% had focal tuberculosis, 4% had generalized tuberculosis).

According to the results of the study, it turned out that there was a significant aggravation in the structure of diagnoses after relapses, with a shift towards forms of tuberculosis that are prone to progression and generalization, with a predominance of destructive forms. The share among diagnoses during relapses of such a favourable form such as focal tuberculosis was minimal (2%), although it was in second place in the structure of primary diagnoses (16%). In the structure of diagnoses after relapses, disseminated tuberculosis took second place. Diagnoses that were not among the primary ones (before relapse) appeared, such as generalized and fibrocavitary tuberculosis. This corresponds to studies data showing that the clinical picture of relapses of pulmonary tuberculosis is much more severe than with newly detected processes [15]. There is an aggravation in the structure of diagnoses due to an increase in drug-resistant forms after relapse. It is noteworthy that among the cases reviewed, 2% were patients who developed a relapse after surgery. This confirms the prevailing opinion in national phthisiology that resection operations are a highly effective method of treatment in case of limited and local pulmonary tuberculosis, [14]. An alarming fact is that among the patients with relapses there were people under the age of 25 years, cured of primary tuberculosis in adolescence, who developed forms of secondary tuberculosis during relapse. All these persons were classified as socially maladapted and came from families with a low general culture and a difficult social and living status, which confirms the role of social and epidemiological disadvantage in their families in the development of the unfavorable course of tuberculosis [9]. With a new coronavirus infection, relapses developed both in the presence and absence of viral damage to the lung tissue, determined by chest CT scan. Identification of relapses in people who have had a new coronavirus infection was often associated with personal responsibility and concern for their own health in socially adapted patients, while socially maladjusted people who were diagnosed with tuberculosis were examined in a hospital during hospitalization for a new coronavirus infection in moderate and severe condition.

CONCLUSION

Thus, the combination of tuberculosis and new coronavirus infection poses certain difficulties at the outpatient stage of TB service in relation to identifying relapses in people with cured tuberculosis. The heavier structure of diagnoses during relapse of tuberculosis, the prone to generalized forms, forms with decay of lung tissue, resistance to anti-tuberculosis drugs, and the development of fibrocavitary tuberculosis becomes even more relevant against the background of a new coronavirus infection as an aggravating factor. Active preventive examination of persons with cured tuberculosis who have suffered a new coronavirus infection is necessary to exclude relapses of tuberculosis infection in them, with the joint work of the polyclinic and the anti-tuberculosis dispensary.

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ANALYSIS OF THE EXISTING NATIONAL AND INTERNATIONAL APPROACHES TO ENSURING RADIATION PROTECTION OF CHILDREN DURING X-RAY EXAMINATION

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ABSTRACT. Level of using X-ray examination in pediatric practice has increased significantly over the past decade. Awareness of availability and prevalence of highly informative examinations (computed tomography, X-ray endovascular procedures, nuclear medicine) leads to corresponding increase in patient doses. In order to successfully ensure the radiation safety of the population in Russian Federation, it is necessary to develop an integrated approach based on the fundamental principles of radiation safety. The basic principles of protecting patients from medical exposure are reflected in all national legislative documents. Unfortunately, the issues of radiation protection of children are not sufficiently lighted in these documents. The purpose of this work was to analyze the existing national and international approaches to radiation protection of children from medical exposure, to identify elements of radiation protection that need updating. Principles of justification and dose limitation were chosen for our work. The analysis of key national and international approaches showed significant differences in practice of radiation protection of children from medical exposure. In foreign practice, special attention is paid to the principle of justification through the development and application of the criteria for justification of X-ray examination. It should be noted that there is no limitation of radiation doses to practically healthy individuals during screening examination. Unfortunately, today the issues of radiation safety of children are not sufficiently covered in the Russian Federation. Therefore, the question of the need to improve the legal and regulatory framework in the field of radiation safety of children during X-ray examinations becomes actual.

KEY WORDS: X-ray diagnostics; radiation protection; radiation safety; X-ray examination; medical exposure; children.

АНАЛИЗ СОВРЕМЕННЫХ ОТЕЧЕСТВЕННЫХ И ЗАРУБЕЖНЫХ ПОДХОДОВ К ОБЕСПЕЧЕНИЮ РАДИАЦИОННОЙ ЗАЩИТЫ ДЕТЕЙ ПРИ ПРОВЕДЕНИИ РЕНТГЕНОРАДИОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ

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РЕЗЮМЕ. За последнее десятилетие значительно увеличиваются объемы применения рентгенорадиологических исследований в педиатрической практике. Повышение доступности и распространенности высокоинформативных исследований (компьютерной томографии, рентгенэндоваскулярных процедур, процедур ядерной медицины) приводит к росту доз облучения пациентов. Для успешного обеспечения радиационной безопасности населения Российской Федерации необходим комплексный подход, основанный на использовании основополагающих принципов радиационной безопасности, — обоснования и оптимизации. Основные принципы защиты пациентов от медицинского облучения отражены во всех основополагающих отечественных нормативно-методических документах. К сожалению, вопросы радиационной защиты детей в этих документах освещены недостаточно. Целью данной работы являлся анализ существующих отечественных и зарубежных подходов к радиационной защите детей при медицинском облучении, направленный на выявление элементов радиационной защиты, нуждающихся в актуализации. Для данной работы были выбраны принципы обоснования и ограничения доз. Проведенный анализ основных отечественных и зарубежных нормативно-методических документов показал наличие значительных различий в практике радиационной защиты детей при медицинском облучении. В зарубежной практике особое внимание уделяется реализации принципа обоснования путем разработки и применения критериев обоснования назначения рентгенорадиологических исследований. Следует отметить отсутствие ограничения доз облучения практически здоровых лиц при проведении скрининговых исследований. Результаты работы указывают на необходимость актуализации законодательной и нормативно-правовой базы в области радиационной безопасности детей при проведении рентгенорадиологических исследований.

КЛЮЧЕВЫЕ СЛОВА: лучевая диагностика; радиационная защита; радиационная безопасность; рентгенорадиологические исследования; медицинское облучение; дети.

BACKGROUND

The health of children and adolescents in the society is a topical issue and a subject of primary importance, as it determines the future of the country, the nation's gene pool, the scientific and economic potential of the society and, along with other demographic indicators, is an

important factor in the country's social and economical development.

Analysis of the dynamics of changes in the general morbidity rate of the child population over the past 10 years indicates a steady increase in the incidence of such major classes of diseases as neoplasms (for children aged 0 to 17), diseases of the endocrine system, the urinary system, and injuries, poisoning and other consequences of external causes for children aged 15 to 17. At the same time, for the entire child population, the leading place among diseases is occupied by respiratory diseases: in 2020 this indicator was 101,956.7 and 66,681.4 per 100,000 children aged 0–14 and 15–17 years, respectively [25–29]. Against this background, there is a growing trend towards increased use of modern diagnostic methods, including methods using ionising radiation sources [15]. Moreover, along with standard radiological studies, more informative radiological methods of investigation (computed tomography, positron emission tomography, interventional studies, etc.) are widely used [15]. The use of new high-tech X-ray radiological examinations is associated with increased radiation doses (both individual and collective).

In this regard, the issue of radiation safety of patients, including children, is becoming more and more urgent. The basic principles and measures of radiation protection of patients from medical exposure are reflected in all fundamental domestic regulatory documents (Federal Law No. 3 "On Radiation Safety of the Population", 99/2009, Basic Sanitary Rules For Radiation Safety (BSRFRS)-99/2010), as well as a number of guidelines and recommendations (Methodological Recommendations 2.6.1.0066-12, Methodological Guidelines 2.6.1.2944-11, MR 2.6.1.1892-04, etc.). But, unfortunately, these documents contain practically no information on the specifics of exposure and radiation protection measures for children. In addition, most of the presented regulatory documents need to be updated, since more than 10 years have passed since their development [10–12, 14, 16, 33].

Improvement of the regulatory framework and preparation of normative documents regulating radiation safety issues, including those related to medical activities, should be carried out taking into account the standards and recommendations of international organisations. This is stated in the main directions of implementation of the state policy in the field of nuclear and radiation safety (Presidential Decree No. 585 of 13 October 2018 "On Approval of the Fundamentals of State Policy in the Field of Nuclear and Radiation Safety of the Russian Federation for the Period until 2025 and Further Perspective") [31].

AIM

To carry out a comparative analysis of existing domestic and foreign approaches to radiation protection of children under medical exposure aimed at identifying elements of radiation protection that need to be actualized.

RESULTS

At present, the basic principles of protecting patients from medical radiation exposure are reflected in all fundamental national regulatory documents [14, 16, 33]. But, unfortunately, there is no information on radiation protection of children in these fundamental documents, although taking into account the specific features of children's organism is a necessary link for providing effective medical and preventive care to the child population. Children's organism is unique, and each age period of a child is accompanied by certain anatomo-physiological features, which should be taken into account when prescribing and conducting X-ray radiological examinations and when organising radiation safety measures for children [13].

Medical exposures are different from other exposures to the public in that people (mainly patients) are deliberately and consciously exposed. The specificity of radiation protection in medical exposures requires different approaches from those applied to other human exposures. Nevertheless, radiation safety of patients should be ensured in all types of medical exposure, provided that the maximum benefit from X-ray radiological procedures is achieved and negative radiation-induced effects on the organism are minimised [14, 16]. The main tool for realising this goal is the use of the fundamental principles of radiation safety — an justification, optimisation, normalisation (the dose limitation) [14, 16, 33]. Within the framework of this work, a comparison of domestic and foreign approaches to the application of the principles of justification and dose limitation was carried out.

The justification principle

The principle of justification is to compare the radiation risk from medical X-ray radiological examinations with the health risk from not obtaining or incompletely obtaining diagnostic information [23, 24].

In applying the principle of justification in the case of medical exposures, a specific approach is required, involving the application of three levels (three-level approach). The first level of justification is the postulate that the appropriate use of radiation in medicine is more beneficial than harmful [23, 24].

The second level of justification is based on an assessment of whether the selected X-ray radiological examinations will improve diagnosis or treatment. This level is implemented through national health authorities through the development and implementation of treatment and diagnostic standards, as well as specialised criteria for the prescription of X-ray radiological examinations developed by national associations of radiologists in collaboration with radiation protection regulators [36, 39–43].

The medical decision support system includes national or international systems of justification criteria developed by professional organisations in cooperation with radiation protection specialists — recommendations of the European Commission; eligibility criteria developed by the American College of Radiology; ESR iGuide from the European Society of Radiology and the American College of Radiology; a set of recommendations of the Canadian Community of Radiologists [34–36].

The main objective of the developed recommendations and systems of justification criteria is that physicians should refer their patients to the most appropriate imaging procedures, not only in terms of the clinical task at hand, but also in terms of radiation safety. An important feature of these guidelines and criteria is the fact that the choice of radiotherapy techniques is made according to their proven efficacy (which based on literature data for the last few years). In addition, they contain information on radiation risk to the patient or values of typical effective doses for each radiological examination. Regular updating of these recommendations and introduction of the criteria into the electronic document management system of medical organisations helps to reduce the number of unjustified X-ray radiological examinations and has a positive impact on the results of diagnosis and treatment, as well as on the health status of patients [34–36].

At the third level of justification, it is necessary to consider the appropriateness of application of a certain X-ray radiological examination to a particular patient, taking into account the exact task of performing the X-ray radiological examination, the clinical picture and individual characteristics of the patient. The third level of justification is implemented directly in the medical organisation in the interaction between the attending physician and the radiologist. In this case, the final decision to perform X-ray radiological examination on a particular patient is made by them, primarily on the basis of their professional experience [36, 39, 40, 42, 43].

It is particularly important to consider the principle of justification when prescribing X-ray radiological examinations to paediatric patients. Because children are at higher risk of stochastic effects, paediatric trials require particular care in the justification of X-ray radiological examinations [2]. Each study should be performed only when indicated by the physician. If it indicated and justified, unnecessary multiple scans of the same area and unnecessary duplication of images should be avoided. Alternative imaging modalities that avoid the risk of ionising radiation, such as ultrasound and magnetic resonance imaging (MRI), should always be considered [37]. In addition, the patient or their legal representative should be informed of the expected benefits, risks and limitations of the proposed X-ray radiological examination, as well as the consequences of not receiving the procedure [37].

In the legislation of RF the principle of justification occupies an important place in the system of normative and methodological documents. According to the Federal Law “On Radiation Safety of the Population” from 09.01.1996, Federal Law No. 3, the principle of justification is “prohibition of all activities on the use of ionising radiation sources, in which the benefit obtained for a person and society does not exceed the risk of possible harm caused by additional exposure to natural radiation background” [33]. The same definition is given in Sanitary Regulations and Norms 2.6.1.2523-09 “Radiation safety standards (Radiation Safety Norms-99/2009)” [14].

The general requirements that should be taken into account to justify the X-ray radiological examinations are reflected in Sanitary Regulations and Norms 2.6.1.2612-10 "Basic Sanitary Rules for Radiation Safety (BSRFRS-99/2010)" [16]. Ehey include clinical indications for diagnostic tests, selection of the most radiation-sparing methods of research and consideration of alternative diagnostic methods. The justification of therapeutic X-ray radiological examinations takes into account that the expected efficacy of treatment is superior to the efficacy of alternative methods, and the risk of refusal of radiation therapy is known to exceed the risk from radiation exposure during its administration [16].

Similar requirements apply to the justification of X-ray radiological examinations in children: the presence of clinical indications, the choice of the most radiation-sparing method for children, mandatory consideration of alternative diagnostic methods, and the fact that the planned study should not repeat recently conducted ones (2.6.1.3387-16 "Radiation Protection of Children in Radiation Diagnostics") [13]. It is important to remember that the use of X-ray radiological examinations in children should be carefully justified from the point of view of comparing the diagnostic benefit and radiation risk of possible long-term consequences.

In practice, the principle of justification is realised through a set of various regulatory and methodological documents. Unfortunately, in the domestic practice there are no recommendations and systems of criteria for justification of X-ray radiological examinations appointments similar to foreign ones. Most of the information tools that facilitate the decision-making process of a medical worker (orders of the Ministry of Health, medical and economic standards, clinical recommendations, professional communities of doctors, etc.) do not pay due attention to the issues of radiation protection of patients and are not coordinated among themselves.

Medical and economic standards are those that are characterised only by the presence of indicators of the frequency and multiplicity of use of various types of investigation. Unfortunately, they do not contain any information about the criteria for selecting radiology diagnostic methods for a particular group of diseases [19–22].

Clinical recommendations that are developed by medical professional non-profit organisations for individual diseases or conditions are widely used in practice [1, 17, 18, 30]. It is quite convenient to use such a resource, because clinical recommendations are publicly available and regularly updates. But, unfortunately, the issues of radiation safety are practically neglected. In the section "Diagnosis" there are no clear criteria for the applicability of various methods, including radiation methods. In addition, there is no information about radiation harm (risk) due to the use of radiation diagnostic methods. This applies to both adult patients and children. To diagnose the same condition, it is recommended to use different methods in terms of the dose received — from ultrasound and MRI, which are not sources of ionising radiation, to high-dose X-ray radiological examinations, which includes, for example, computer tomography [1, 18].

However, it should be noted that there is currently a series of guidelines issued by the Moscow City Department of Health Care "The Best Practices in Radiation and Instrumental Diagnostics". A number of these guidelines have been updated together with radiation safety specialists and supplemented with information on radiation risks during X-ray radiological examinations [5–9]. For each syndromal and nosological category a list of radiotherapy diagnostic methods is given. They are divided into three groups (main method, additional method, method not shown) depending on the ranges of effective dose values. In addition, for each range of effective dose values radiation risk categories and graphical visualisation are given. It should be noted that these guidelines apply only to adult patients. In the same series of methodological recommendations there is a publication devoted to radiation diagnostics of injuries, diseases and other pathological conditions in children [4]. However, there is no information about the values of effective doses and radiation risks associated with the use of radiotherapy diagnostic methods.

Comparison of approaches to justification of X-ray radiological examinations has shown significant differences between the Russian Federation and foreign countries in the practice of radiation protection in medicine. Foreign approaches are based on the choice of X-ray radiological examinations taking into account the diagnostic efficiency, the cost of the study, and patient exposure levels (radiation risks) in the aggregate [34–36, 39–43]. In domestic practice, the choice is based only on the diagnostic ef-

ficiency [1, 17–22, 30]. Thus, in foreign practice, a multifactorial approach to justification of X-ray radiological examinations taking into account the risk-benefit analysis. Implementation of such an approach is reasonable in domestic radiology diagnostics.

In the Russian Federation, in accordance with regulatory and methodological documents, the Federal Service for Supervision of Consumer Rights Protection and Human Welfare ("Rospotrebnadzor") is responsible for the requirements for justification of X-ray radiological examinations, dosimetry and subsequent assessment of radiation risks. However, control over the fulfilment of the justification principle is beyond its competence. In addition, regulatory documents on the interpretation of radiation risks in medicine are not mandatory, but are of a recommendatory nature and, as a consequence, are extremely limited in their application in practice [3].

Thus, the development of approaches to justification of X-ray radiological examinations similar to foreign approaches should be implemented together with the Ministry of Health of the Russian Federation, which is currently planned to be implemented within the framework of the draft of the new Federal Law on Radiation Safety of the Population. At the regional level it is advisable to develop justification criteria taking into account the hardware, technical and other capabilities of a particular constituent entity of the Russian Federation. This approach is implemented by the Moscow City Health Department [4–9].

Thus, both existing and planned clinical standards should be improved by including information on radiation risk categories and effective dose ranges for all X-ray radiological examinations used. This will help doctors not only to make a reasonable approach to the choice of diagnostic imaging methods, to take into account the diagnostic efficiency of radiotherapy diagnostic methods and the patient's exposure level, but also to inform the patient or his/her parents about the expected radiation dose and possible health consequences.

The principle of rationing (the dose limitation)

Medical radiation exposure of patients, including children, is not rationed. In modern international recommendations, the principle of dose limitation when using ionising radiation sources in medicine is not applied, as its use may negatively affect the quality of medical care provided to patients. Publications of the Medical Commission on Radiation Protection (MCRP) 103 [23] and 105 [24] note that medical exposure is intentional and voluntary, provided that it will directly benefit the health of the patient.

The International Atomic Energy Agency (IAEA) Safety Standards GSR part 3 [2] and Safety Standard SSG-46 [38] propose an approach that recommends the use of dose constraints for X-ray radiological examinations that are conducted for professional and legal purposes and to individuals involved in biomedical research. A dose constraint is a prospective, source-specific limit on the individual dose from a source in situations of planned exposure (other than medical exposures to patients) that serves as an upper limit on the dose predicted in the process of optimizing protection from that source. Dose limits are not dose constraints, so an exceedance of a dose limit does not constitute non-compliance, but each such exceedance should be investigated [23].

Some X-ray radiological examinations, particularly when the patients are children, are best performed with the assistance of a caregiver or patient comfort person, such as a relative. In such situations, the person providing care or comfort to the patient will be exposed to radiation, usually at a low dose. Radiation protection measures for such a person should be borne in mind and dose constraints should be applied as part of this process (p. 3.173 of GSR Part 3) [2]. In addition, parents or a caregiver should be provided with lead aprons and advised to remain out of the primary ray if it's possible.

In addition, X-ray radiological examinations include the standard use of lead or equivalent shielding of the child's body in close proximity to the diagnostic field. However, this is only true if the shielding is properly positioned. If not properly placed, such shielding can degrade image quality and in some cases may be inappropriate. In the Russian Federation, the fundamental documents in the field of radiation protection also state that the principle of dose limitation is inapplicable in the case of medical exposure. Thus, Sanitary Regulations and Norms 2.6.1.2523-09 "Radiation Safety Norms (NRB-99/2009)" contains information that radiation protection of patients in case of medical exposure should be based on the necessity to obtain a useful effect

from the relevant medical procedures at the lowest possible exposure levels. It does not set dose limits for patients, but applies the principles of justification for prescribing medical procedures and optimising patient protection [14]. A similar requirement is contained in BSRFRS-99/2010: "Radiation safety of persons undergoing medical X-ray radiological examinations (diagnostic, therapeutic, prophylactic, research) shall be ensured by justification of such procedures and optimisation of radiation protection. The doses received by patients during radiological procedures are not rationed" [16].

The dose limitation for medical exposures applies only to persons receiving medical X-ray radiological examinations in connection with professional activities or as part of medical and legal procedures, or participating in preventive examinations or in biomedical research, who do not derive direct health benefits from radiation related procedures. The annual effective dose due to these procedures should not exceed 1 m3v [14, 16]. In addition, NRB-99/2009 stipulates that persons other than medical personnel who assist in supporting patients (critically ill patients, children, etc.) during radiological procedures should not be exposed to a dose exceeding 5 m3v per year [14].

The principle of dose limitation in medical irradiation is reflected in all international documents [2]. Moreover, the risk groups for dose limitation and the range of these doses in domestic and foreign practice are relatively the same, with the only difference being that in foreign practice the dose ranges may change depending on the benefit/harm ratio, for example, when radiating volunteers in biomedical research.

In the Russian Federation, the dose limitation for medical exposure applies to individuals who do not receive direct health benefits from radiation-related procedures, including preventive examinations [14, 16]. But according to Federal Law No. 323, a patient is an individual who receives medical care or who has applied for medical care regardless of whether he or she has a disease and regardless of his or her condition [32]. That is, a person who undergoes a preventive examination is also a patient, but the fundamental documents in the field of radiation protection of the Russian Federation state that dose limits for patients are not established. This disagreement has not been resolved at the moment. Therefore, it is necessary to refuse to limit doses in medical exposure or to reduce the risk groups to which this limitation applies.

CONCLUSION

There is no doubt that all currently developed radiation protection means and techniques are used in medicine. The existing system of regulatory and methodological support allows to effectively provide comprehensive radiation protection from medical exposure in all types of X-ray radiological examinations. But, unfortunately, it has to be stated that at present the issues of radiation safety of children in the Russian Federation are insufficiently covered. That is why the need to improve the legislative and regulatory framework at the federal and regional levels in the field of radiation safety of children during X-ray radiological examinations becomes an urgent issue.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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FROM THE HISTORY OF STUDYING CHILD ALCOHOLISM IN RUSSIA IN THE SECOND HALF OF THE XIX — BEGINNING OF THE XX CENTURIES (PART II)

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ABSTRACT. The second part of the article continues viewing the problems of study the influence of alcohol abuse on the child's body at the turn of the XIX–XX centuries. The analysis of domestic scientific literature revealed that along the works that provided an overview of the investigations of domestic and foreign authors published at that time, a sufficient number of studies based on the results of the authors' own observations had already appeared. Especially positive was the fact of preparing dissertations of an experimental nature, in which evidence of the negative effect of alcohol consumption on the growing organism was given. The experiments were conducted on young small in size animals and birds, while histological, biochemical, and clinical techniques were widely used in the process of setting up the experiment, behavioral reactions were studied, the weight and height of the animal and its individual organs were measured in comparison with the control group. Cases of the birth of defective offspring in people who were alcohol abused, known since ancient times, attracted attention of many researchers during that period, lively discussions were held on this topic, scientific papers were published. Most of the authors'works who shared the opinion about the grave influence of alcohol on heredity were based on clinical and statistical analysis. There are works of psychiatrists, teachers, criminologists, public figures proving close etiological connection between consumption of alcoholic beverages in childhood and adolescence and marginalization of children and adolescents, the development of various forms of deviant behavior (crime, suicide, prostitution), mental illness, high mortality. Numerous scientific studies of the scale of alcohol consumption by children, harmful effects of alcohol consumption on the child's body, the consequences to which it leads, have contributed to the formation of idea that the cause of alcoholism in children is the totality of socio-economic living conditions that children are exposed to: hunger, incredible crowding in the premises, family situation created on the basis of ignorance, constant need and deprivation, desperate exploitation of labor. Great claims were made to school, where, according to the evidence of that time, there were all conditions for the prosperity of consuming alcohol: violation of elementary rules of sanitation, high academic load, lack of educational work, in general, the "gray everyday life" of

a student. Caring people — doctors, scientists, lawyers, teachers, public figures, representatives of the clergy organized various commissions, circles, gathered congresses, developed programs for conducting sobriety lessons in schools, organized courses for teachers in order to teach them how to work with schoolchildren to promote sobriety, etc. However, no holistic program aimed at combating this evil was created. There were also no forces and means capable of at least mitigating the effects of factors contributing to the development of drunkenness among children and adolescents. Most commonly, among the main directions of the fight against alcoholism, the need for state measures was called.

KEY WORDS: Russia; children; alcoholism; the study of the effects of alcohol on the body of children and adolescents; hereditary alcoholism; suicide; child mortality; socio-economic factors; the fight against alcoholism of children and adolescents.

ИЗ ИСТОРИИ ИЗУЧЕНИЯ ДЕТСКОГО АЛКОГОЛИЗМА В РОССИИ ВО ВТОРОЙ ПОЛОВИНЕ XIX — НАЧАЛЕ XX вв. (ЧАСТЬ II)

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РЕЗЮМЕ. Вторая часть статьи продолжает рассмотрение проблем изучения влияния алкоголя на детский организм на рубеже XIX–XX веков. Анализ отечественной научной литературы показал, что наряду с работами, представлявшими обзор опубликованных к этому времени трудов отечественных и зарубежных авторов, появилось уже достаточное число исследований, основанных на результатах собственных наблюдений авторов. Особенно позитивным был факт подготовки диссертационных работ экспериментального характера, в которых приводились доказательства негативного действия алкоголя на растущий организм. Опыты проводились на молодых мелких животных и птицах, при этом в процессе постановки эксперимента широко использовались гистологические, биохимические, клинические методики, изучались поведенческие реакции, проводилось измерение веса и роста животного и его отдельных органов в сравнении с контрольной группой. Известный с древности факт рождения неполноценного потомства у людей, злоупотребляющих алкоголем, в этот период привлек внимание многих исследователей, на эту тему велись оживленные дискуссии, издавались научные труды. Большинство авторов, разделяющих мнение о патологическом влиянии алкоголя на наследственность, основывались на клинико-статистическом анализе. Выходят работы психиатров, педагогов, криминалистов, общественных деятелей, доказывающих тесную этиологическую связь между употреблением спиртных напитков в детском и юношеском возрасте и маргинализацией детей и подростков, развитием у них различных форм девиантного поведения (преступления, самоубийства, проституция), психических заболеваний, высокой смертности. Многочисленные научные исследования масштаба употребления детьми спиртных напитков, вредного влияния алкоголя на детский организм, последствий, к которым он приводит, способствовали формированию представления, что причиной алкого-

лизма детей является вся совокупность социально-экономических условий жизни, которым подвергаются дети: голод, невероятная скученность в помещениях, семейная обстановка, создавшаяся на почве невежества, нужды и лишений, отчаянная эксплуатация труда. Большие претензии предъявлялись к школе, где, по свидетельствам того времени, присутствовали все условия для процветания пьянства: нарушение элементарных правил санитарии, высокая учебная нагрузка, отсутствие воспитательной работы, вообще «серая будничная жизнь» школьника. Неравнодушные люди — врачи, ученые, юристы, педагоги, общественные деятели, представители духовенства организовывали различные комиссии, кружки, собирали съезды, разрабатывали программы проведения уроков трезвости в школах, устраивали курсы для учителей с целью подготовки их к проведению работы со школьниками по пропаганде трезвости и др. Однако целостной программы, направленной на борьбу с этим злом, создано не было. Отсутствовали также силы и средства, способные хотя бы смягчить действие факторов, способствующих развитию пьянства среди детей и подростков. Все чаще среди основных направлений борьбы с алкоголизмом называлась необходимость принятия мер государственного характера.

КЛЮЧЕВЫЕ СЛОВА: Россия; дети; алкоголизм; изучение действия алкоголя на организм детей и подростков; наследственный алкоголизм; самоубийства; смертность детей; социально-экономические факторы; борьба с алкоголизмом детей и подростков.

The recognition of the existence of child alcoholism, the results of the study of the prevalence of children's use of alcohol-containing drinks and the statement of the harm they cause, contributed to increased public attention to these problems, demanded "urgently ... comprehensive coverage and clarification" [32]. Literature on the effect of alcohol on the animal organism in general and in particularly on the human health, on the harm of alcohol abuse and the need to fight it, on alcoholism as a disease by the beginning of the XX century numbered in hundreds of titles. A large list is given in N.I. Grigoriev's dissertation "Alcoholism and Crimes in St. Petersburg" (1900) [14]. One of the first books in his book list dates back to 1483 and was published in Germany. Books in Russian of general anti-alcoholic orientation, including those from the position of a doctor, at first translated, appear in Russia at the very end of the XVIII century. Until the 70–80s of the XIX century, most works described clinical observations of a fragmentary casuistic nature. There were still extremely few publications specifically examining the effects of alcohol on the developing organism on the basis of experimental studies on animals.

Domestic and foreign sources on alcohol and alcoholism are collected in dissertations of domestic physicians, with the first place in number and solidity occupied by the works carried out at the Imperial Military Medical Academy (IMMA). Among them one of the first is I.M. Sechenov's (1829–1905) dissertation "Materials for the future physiology of alcohol intoxication" (1860) [49].

At the end of the XIX century in Russia, journals with an anti-alcoholic orientation began to be published. The first Russian anti-alcoholic journal — a monthly magazine "Herald of Sobriety", was published in St. Petersburg from 1894 to 1917, its editor-publisher was Doctor of Medicine N.I. Grigoriev (1853–?). The magazine published materials on how to fight drunkenness, what measures to take against this evil in public and family life, in schools and in the army. From 1896 to 1916 the magazine "Activist" was published in Kazan, the editor-publisher of which was A.T. Solovyov (1853–1918), the chairman of the Kazan society of sobriety. Another magazine — "Sober Life" was published in St. Petersburg by the Alexander Nevsky Society of Sobriety from 1905 as a monthly, and from 1909 as a monthly literary and popular-publicistic magazine. Its editors were priests A.V. Rozhdestvensky (1872–1905), the founder of the Alexander Nevsky Society of Sobriety, and P.A. Mirtov (1871–1925). The journal "Sober Life" (in 1915–1916 it was called "Family life") published supplements: in 1905–1908 — monthly magazine "Leaflet of Sobriety for Schoolchildren", in 1909 — "Zorka" magazine. The number of published anti-alcohol magazines especially increased at the beginning of the XX century.

Russian Society for the Protection of Public Health published works on the harmful effects of alcohol in medical periodicals, devoted to hygiene issues, 1901–1913 (hereinafter the

journal was published under the title "Hygiene and Sanitary Business"); in the Journal of the Society of Russian Doctors in Memory of N.I. Pirogov, 1901–1908. (hereinafter — "Public Doctor", 1909–1916); in the Bulletin of Public Hygiene, Forensic and Practical Medicine, 1894–1914; weekly medical newspaper devoted to all branches of clinical medicine, public and private hygiene and medical life issues "Russian Doctor", 1901–1916, etc.

The works devoted to the effect of alcohol on children's organism, including those taking into account the peculiarities of childhood and adolescence, began to be published in the 80s of the XIX century, but their number increased in the first decades of the XX century. Among the great number of works, let us name those in which the most clear evidence of the harmful effect of alcohol on children's organism was given, obtained not only on the basis of a review of works published by that time by foreign and domestic authors, but also on the basis of the results of their own observations and researches.

One of the first generalising works, raising the problem of children's alcoholism and its effect on the child's organism among the medical community, was the lecture of the children's doctor V.F. Yakubovich (1857–?) "About children's alcoholism and the effect of wine on children's organism", already mentioned in the first part of the article, which was read on 16th February 1893 at the meeting of the St. Petersburg meeting of doctors [64]. In it V.F. Yakubovich gave examples from the literature and his medical experience about the "ruinous" influence of alcohol even in small quantities on children of different ages. He gave a brief overview of "painful changes" in the cardiovascular, digestive, nervous, and bone systems, noted metabolic disorders and a sharp delay in physical and mental development in children who drink alcohol. He also drew attention to the fact that children who drink alcohol are more susceptible to colds. He called the brain and the nervous system in general the most sensitive to alcohol. On In the second place he put the stomach, intestines and liver, in which under the influence of alcohol "develops the same suffering as in adult drinkers, known as cirrhosis or liver of drunkards, ...this entails the dropsy of the stomach, general dehydration and death" [64].

40 cases of cirrhosis of the liver in children from 2 to 18 years of age developed from the use of wine were described from 1880 to 1906. The majority of cases (32) were between 2 and 9 years of age. One of the first domestic works in which cirrhosis of the liver in a child was considered was an article "A case of alcoholic cirrhosis of the liver in a seven-year-old child" written by E.M. Goldengorn (1859–1897) published in the journal "Medical Review" [12]. In 1893, Professor N.I. Bystrov (1841–1904) described a case of liver cirrhosis in a child drunkard and made a report on this topic at a meeting of the St. Petersburg Society of Children's Physicians [8].

The speech of V.K. Demme (1802–1867), a physician from Riga, at the 56th Annual Act of the University of Bern in 1895, "The influence of alcohol on children's organism" caused a great resonance. In his speech he described the characteristic features of school-age children who use alcoholic beverages [17]. We find references to this work, as well as to the works of many foreign scientists studying the influence of alcoholism on various body systems (G. Bunge, E. Kraepelin, M. Gruber, A. Grotjahn, E. Hirt, E. Neumann, R. Krafft von Ebing, A. Steffen, etc.) in books and articles by domestic authors of this time.

The article by F.F. Erisman (1842–1915) "The influence of alcohol on children's organism and the fight against alcoholism among young people" (1897), which contains a fairly complete coverage of the problem that has not lost its relevance to this day, made no less strong an impression [63]. Showing the effect of alcohol on circulatory, digestive and other organs, F.F. Erisman emphasised its negative effect on the nervous system due to anatomical and physiological features of children's brains, for which alcohol is a paralysing poison. Because of this, epilepsy, St Witt's dance (chorea), neurasthenia and other disorders develop. He also considered dangerous the effect of alcohol on problems with memory, behaviour, in general its influence on the physical, mental and moral development of children. He wrote: "The ethical, moral side of the question of premature consumption of alcohol by children and its abuse by young people cannot be ignored. For the man himself, for his family, finally, for the society in which he lives and for the state to which he belongs, the paralysing influence of alcohol on moral strength, on character, on ideal aspirations, in a word, on the ethical side

of the personality is of great importance. A boy or young man accustomed to the use of alcoholic drinks, because of the weakening influence of alcohol on his will, little by little loses power over his passions, especially over bad instincts and inclinations. He loses the ability to resist the temptations which his young and ardent imagination is presented on all sides. He loses the desire for the good, the sublime and becomes a victim of base passions; he finally does not stop even before a crime and often ends up committing suicide. Doctors and lawyers in their practice quite often meet with such subjects, sad victims of alcoholism, the germ of which even in early youth was laid in the receptive soil of a child's organism by the unreasonable behaviour of others" [63].

The first experimental works on the effect of alcohol on the growing organism deserve special attention. One of the first belongs to the famous physiologist, head of the physiology department of the Imperial Military Medical Academy, Professor I.R. Tarkhanov (1846–1908). He studied the effect of alcohol on the development of psychomotor centres in puppies, young rabbits and guinea pigs [55]. This study was of great importance for understanding the development of the brain and nervous system of newborns. I.R. Tarkhanov argued that the entire process of growth and development of newborns is closely dependent on the degree of development of the central nervous system, so he attached special importance to the fact of delaying its development under the influence of alcohol. In his study he observed that the development of the brain in general and of the psychomotor centres in particular was delayed in animals receiving alcohol, in contrast to the control group. These disturbances due to alcoholisation of the diet were accompanied by a general delay in the growth and development of the whole organism. The weight of young animals receiving alcohol was significantly lower than that of control animals.

The work of psychiatrist G.V. Reitz (1876–1948) "The Influence of Chronic Alcoholism on the Development of the Organism" (1900), which was carried out in the laboratory of Professor V.M. Bekhterev, is also noteworthy. The author gave the results of a comparative study of the puppies organs (which were not older than 2 weeks and fed on mother's milk) and young rabbits, which were given alcohol in increasing doses and concentrations (from 2.5 to 20% and even up to 40%) with prolonged use (up to 88 days). Comparison was made with the control group. The effect of increasing doses of alcohol on weight and growth, as well as behaviour of animals in dynamics was studied [41]. After autopsy all organs were measured and weighed, their morphology was studied.

The results indicated a striking effect of alcohol; very significant changes were recorded in all organs, especially in the brain, spinal cord, peripheral nervous system, liver ("cirrhotic degeneration") and others. When weighing the brain, it was found that in all cases its cerebral hemispheres, especially the frontal lobes, weighed less in the animals receiving alcohol than in the corresponding control ones. It was found that the nerve cells of the grey brain and large pyramidal cells are mainly affected. Nerve centres are affected in the reverse order of their development. Hyperaemia of membranes, skull bones and brain substance was observed in all animals at autopsy. These changes were not observed in the control group.

Brain functions were significantly disturbed. The author described the clinical manifestations in animals receiving alcohol: the shivering appeared, it was incessant. The animals became boring, did not play, did not run, did not understand the flirtations of their healthy brothers or unsuccessfully responded to them; they began to walk later, walked badly, one literally did not know how to dispose of his limbs, stepping on the back of the foot; "alcoholics" clearly lagged behind in mental development; their eyes opened later than the control ones. The most drastic effects were observed in those cases when alcohol was given from a very early age. Thus, even at lower doses, the author observed significant changes in 4-day-old puppies.

Another experimental work came out of the laboratory of the famous pathologist, professor of the Imperial Military Medical Academy K.N. Vinogradov. This is a dissertation for the Doctor of Medicine degree by S.R. Pergament (1872–?) "On the influence of alcohol poisoning of rabbits on the growth of their fetuses womb bones", defended in 1900 at the IMMA [37]. His experiments consisted in the following: he gave rabbits from the moment of gestation to the end of pregnancy daily, in two receptions 20% alcohol solution in the amount of 4 drops per kilogram of weight in order to study the effect of alcohol poisoning on the growth of bones of fetuses. When the weight

of the animals dropped, the alcohol was either reduced or even stopped for a while. Based on the study of changes in the bones, the author concluded that alcohol slows down the growth of bones of womb fetuses exposed to poisoning throughout pregnancy, causes regressive phenomena consisting in an increase in the number of hypertrophic cells with sharply expressed vacuolisation and reticulation of protoplasm, a decrease in wrinkled elements and the number of osteoblasts and other changes.

Dr N.I. Frontkovsky (1960–?), interested in the question of the influence of alcohol on the sexual sphere in general and on the internal genital organs in particular, in the process of working on his dissertation studied the influence of alcohol poisoning on pathological and anatomical changes in the ovaries of animals, on "the vital activity of the ovaries, expressed in the reproduction of the offspring, and on the offspring itself" [57]. Rabbits, dogs, geese were subjected to alcoholisation for 11 to 170 days, 20% alcohol was given at a dose of 3–4 g per kilogram of weight. He found that under the influence of alcohol the number of mature follicles decreases, there is hyaline degeneration of the egg cell itself and its nucleus, quite early fatty degeneration. One of the conclusions of N.I. Frontkovsky is that alcohol poisoning of female rabbits qualitatively and quantitatively affects their offspring. There are often abortions, many cubs are born dead, and many of those born alive die in the first days of life. Thus, for 16 pregnancies in animals receiving alcohol, there were 9 premature births; of 33 born, 7 were stillborn, i.e. 21%; 24 died within the first 3 days (73%) and only 2 survived. Among the control animals there were neither premature births nor stillbirths. Deeply immersed in the subject of the study, N.I. Frontkovsky wrote in his thesis that "the question of the effect of alcohol on various tissues of the body occupied not only doctors, but almost all intelligent people, which is quite understandable if we remember the moral harm that brings society this scourge of humanity" [57].

The conclusions of N.I. Frontkovsky were confirmed by the results obtained by Dr N.P. Sadokov (1870–?) while working on his dissertation on "Changes in testicles and semen in the poisoning of animals with ethyl alcohol (vodka)", defended at the IMMA in 1902 [43]. The author experimented on rabbits, roosters and dogs.

Of particular interest is also the dissertation for the degree Doctor of Medicine degree by I.V. Sazhin (1868–?) "The influence of alcohol on the developing organism", defended in 1902. The subject of the thesis was proposed by the head of the Department of Children's Diseases of the IMMA, the greatest paediatrician N.P. Gundobin. The author in his dissertation expressed his deep gratitude to "the esteemed Professor Nikolai Petrovich Gundobin both for proposing the topic, which gave the opportunity to study such an interesting and important in theoretical and practical terms issue, and for permission to study in his clinic" [46]. The censors of the dissertation were: Academician A.Y. Danilevsky, Professor N.P. Gundobin and Docent M.S. Dobrotvorsky.

I.V. Sazhin's dissertation collected material on the influence of alcohol (vodka, wine, beer, liqueurs, etc.) on the growing organism in childhood, adolescence and specifically on individual organs and systems — digestive organs, liver, nervous system, metabolism, blood, heart, lungs, bone tissue and growth, as well as morbidity, through the prism of anatomophysiological features. He emphasised the special, extreme susceptibility and sensitivity of all systems of the child body to the harmful effects of alcohol. In addition, the dissertation analyses the works published by foreign and Russian authors on the effect of alcohol on the offspring of drinking parents, the effect of alcohol on infants fed with mother's or nurse's milk. I.V. Sazhin concluded that even insignificant amounts of alcohol in breast milk can cause severe painful phenomena in infants: disorders of the digestive organs, disorder of general nutrition, rashes on the skin and more or less intense phenomena of irritation of the central nervous system and others. He also drew attention to the fact that alcohol contributes to high morbidity in children, including infectious diseases, and explained it by the anatomo-physiological features of the organs and systems of the child's body, more developed lymphatic system, "significant expenditure of vital energy of cells for enhanced processes of growth and development" [46].

Prominent Russian psychiatrists I.P. Merzheevsky, I.A. Sikorsky, V.M. Bekhterev, S.S. Korsakov, V.P. Serbsky, A.M. Korovin and many others established the undoubted influence of alcoholism of ancestors and parents on the appearance of mental illness in offspring. In

the opinion of I.P. Merzheevsky (1838–1908), expressed in his report at the opening of the First Congress of Russian psychiatrists in Moscow in 1887, the cause of nervous and mental diseases in most cases are "the consequences of abnormal social conditions". Among them he named such causes as "wars, economic crises, bankruptcies, cultural backwardness, excessive demands of school, alcohol abuse, sexual perversions", etc. [31]. I.P. Merzheevsky believed that 48.3% of mentally ill people owe their suffering to alcoholism of their forefathers or parents. It should be noted that many reports at this congress expressed serious concern about the moral degeneration of the nation, rampant drunkenness, the increasing number of mental illnesses and suicides. In the case of children, it was pointed out that the children of alcoholics inherit an equal, if not greater, predisposition to diseases of the nervous system as the children of the nervous and mentally ill people.

The impact of alcoholism on heredity. During this period, both in foreign countries and in Russia, lively discussions were held around the issue of the influence of alcohol on heredity, the impact of alcoholism on the genetic potential of the future generation. The press started talking about the degeneration of the Russian people due to mass underbirth, alcoholism, syphilis [60]. Most authors considered the inheritance of drunkenness from ancestors and parents to be an indisputably established fact. Extensive literature had already been accumulated on this problem, including experimental studies and clinical and statistical analyses.

A small book by I.V. Sazhin "Heredity and alcoholic beverages. The Role and Importance of Alcoholic Drinks in Spiritual and Physical Degeneration" (1908) [48] and his speech at the First All-Russian Congress to Combat Drunkenness "Alcohol and Heredity" (1910) [44]. He paid special attention to the results of experimental studies on the harmful effects of alcohol on the young organism. Concluding his report, he once again emphasised that "the incalculable ruinous consequences of alcoholic heredity are not a hypothesis, but an unshakable scientifically established fact", that alcohol, along with socio-economic factors, is the most significant cause of spiritual and physical degeneration of offspring. All the grave consequences of their parents' indiscretion are carried by "innocent little creatures", since alcoholic heredity manifests its destructive effects predominantly in childhood. He especially urged pregnant women to abstain unconditionally from all alcoholic beverages. Against alcoholism requires a fierce, tireless struggle, the front line of which should be, in his opinion, people of science, because behind them knowledge, but "before all and ahead of all, and in word and action should be doctors" [44].

N.I. Grigoriev, who observed many families as a doctor of the Spasskaya part of St. Petersburg, believed that hereditary drunkenness occurs in 67%. He noted that "a characteristic and alarmingly unfortunate difference of hereditary drunkenness is its manifestation at an earlier age, especially during various perturbations in the body — as a period of manhood, first menses, etc." [15]. He pointed out three main features characteristic of alcoholic heredity: innate attraction to alcoholic beverages, specific sensitivity to alcohol and early abuse of alcohol. It was in alcoholic heredity that one of the main causes of "more and more frequent" child alcoholism was seen.

N.I. Grigoriev cited official statistics on rejected conscripts in 1902–1904. Thus, out of 227,158 conscripts, 19.5% were found unfit for military service due to hereditary alcoholism. The aggravated heredity was expressed in the following diseases: "scrofulous thinness" — 15.5%, nervous diseases (paralysis) — 5%, idiocy and insanity — 9.3%, deafness and deaf-mute — 10.6%, "chest narrow and rachitic" — 19.2%, chronic inflammation of the lungs — 17.2%, chronic catarrh — 23.2%. N.I. Grigoriev clearly stated: "The health of young people called to serve military conscription is an indicator of the health of the country, an indicator of its social and sanitary improvement" [15]. Referring to the materials of psychiatric hospitals in Tula and Yaroslavl for 1903–1906, he concluded that negative heredity affects equally both on the fathers and maternal lines.

According to the reports of 12 psychiatric institutions for 1894–1895, in case of drunkenness the aggravated heredity was noted in 83% of men and 9% of women, and in case of chronic alcoholism — in 70% of men and 19% of women [60]. On the basis of his observations, Dr M.S. Morozov (1853-?) indicated in his dissertation that parents' drunkenness could be considered the cause of idiocy in 33% of children [34]. Professor F.E. Rybakov (1868–1920), based on his long-term observations in

the Moscow Psychiatric Clinic and its outpatient clinic, believed that hereditary disposition to drunkenness or "neuropsychiatric" diseases occurs in 88.8 to 91.7% of patients (he examined 1974 people: 1798 men and 176 women suffering from various forms of alcoholism) [42].

The opinion about the possibility of the inheritance of predisposition to alcoholism and the influence of hereditary alcoholism on the state of health and deviation of the young generation was shared by many authors. German psychiatrist, professor of Heidelberg University E.W. Kraepelin (1856–1926), known for his civil position on the prevention of alcoholism wrote: "Alcohol acts on the nerves of a child in a directly devastating way. The best way to turn a child into an idiot is for him to consume so-called reinforcing drinks. Thousands of mothers, through over-caring and misunderstanding of the case, poison their dearest beings by giving them a remedy that makes the child stupid, drowsy, deprived of energy, and after a while turns into a physical or mental cripple" [6]. Doctors pointed to the extreme frequency of convulsive phenomena, congenital deformities, dementia, hysteria, neuroses, paralysis, epilepsy, behavioural abnormalities in the children of drunkards, explaining it by the already established fact that the sharpest toxic effect of alcohol has on the central nervous system. In this connection, it should be noted that in 1890 V.F. Yakubovich translated into Russian the book "Mental Disorders in Childhood" (Die psychischen Störungen des Kindesalters) by H. Emminghaus (1845–1904), one of the first specialists in the field of mental illnesses of children and adolescents, from 1880 to 1886 Ordinary Professor of Psychiatry at the University of Dorpat [62]. This book was regarded as a major scientific achievement, it marked the beginning of the modern stage in the history of child psychiatry. G. Emminghaus began to study psychoses in children and distinguished the following forms: 1) cerebral neurasthenia; 2) melancholia with suicidal tendencies; 3) mania; 4) acute dementia; 5) hypochondria; 6) paranoia; 7) obsessive thoughts; 8) transient insanity; 9) periodic insanity; 10) moral insanity; 11) idiocy; 12) epilepsy [24]. Referring to the works in this area, I.V. Sazhin made an important conclusion-warning: "Alcohol, being a narcotic, paralysing poison for the nervous system in general, even in very small quantities can have a profoundly destructive effect on the nervous system, passing through various stages of energetic development in childhood and adolescence. First of all, the area of higher mental activity is affected — moral, volitional, intellectual abilities, which are in a period of vigorous evolution. If the widespread in modern society nervousness, neurasthenia, pessimism, weak-willedness, premature disappointment in life and egoistic beginnings are caused by numerous and diverse social and economical reasons, the early use of alcoholic drinks and the more so their abuse plays in this regard is far from unimportant, and maybe even an outstanding role" [46].

In 1910, I.V. Sazhin published a small book "Alcohol and the nervous system" [45]. In 1914 he published a book "The influence of alcoholic drinks (alcohol) on the nervous system of the adult and developing organism", representing a fairly detailed review of foreign and domestic literature on this problem [47].

At the same time, some publications contained more cautious statements on the subject. Sometimes it was directly stated that it would be an inexcusable mistake to explain the occurrence of a serious illness by heredity alone, and attempts were made to prove that the heredity of drunkenness was only apparent. There was a view of alcohol only as a cause of psychosis in alcoholics, "because it disturbs the correctness of the secretory functions of the organism". The view was also challenged that a large percentage of crime was caused solely by the influence of alcohol, often it was only a stimulus to crime. Thus, the famous German doctor, founder of social hygiene A. Grotjahn (1869–1931) argued that the coincidence of parents' drunkenness and offspring's alcoholism can be explained quite satisfactorily without recognising in such cases the influence of "hereditary transmission in the natural-scientific sense of the word" [65]. He attached great importance to factors of the social environment.

But without recognising heredity as a comprehensive factor in the creation of a drinking habit, many doctors were convinced that parental alcoholism was a predisposing factor for children to abuse alcoholic drinks. Repeatedly at the Congresses of the Society of Russian Physicians in memory of N.I. Pirogov, the question of whether alcoholism is a hereditary disease was raised. In the report "To the method of studying alcoholism of personality" at the X Pirogov's Congress (1907), A.M. Korovin (1865–1943) noted that in the formation of bad

habits in young people a much greater role is played not by heredity, but by environmental conditions, the situation in the family [26].

Psychiatrist and psychologist F.E. Rybakov believed that if a child is placed in a favourable environment, then with proper education it is possible to "develop a whole, stable and useful for society type" [42]. He was supported by the doctor and public figure V.Y. Kanel (1873–1919): "Ultimately, it is not heredity that gives rise to drunkenness, but the totality of conditions, among which lives a person with an inherited weak will, with a weak, sickly organism, unable to provide proper resistance to the contagion carried in his environment, temptations, cleverly setting their nets and catching the weak and infirm" [23]

The influence of alcohol on the physical and mental development of school-age children, as well as on the social behaviour of the child was studied by psychiatrist A.M. Korovin. A total of 21,720 pupils were examined under his supervision, including 13,984 boys and 7,736 girls. Among boys there were 9721 (69.5%) drinkers, among girls — 3766 (48.7%). A.M. Korovin obtained the following results with regard to the physique of schoolchildren: 16.2% of drinking pupils had a weak physique, and 14.7% of sober pupils had a weak physique too. In those who drank to excess, the percentage of weak increased in boys to 20.2% and in girls to 17.5%. It was concluded that alcohol consumption contributes to delayed physical development of pupils.

On the basis of his extensive observations, A.M. Korovin came to disappointing conclusions about the influence of alcohol on the mental development and success of pupils. Mental retardation was found among drinking pupils in 25.4% of boys, among sober ones — in 20.8%; among drinking girls — in 22.7%, and among sober ones — in 19.4%, i.e. mental retardation was also more common among drinking children [27].

Alcohol had some influence on the behaviour of students as well. Out of a total of 4336 non-drinking boys, 97.2% had good behaviour and 2.8% had bad behaviour. Among the 9,626 boys who drank, only 94.7% had good behaviour and 5.3% had bad behaviour, i.e. more boys who drank had bad behaviour than boys who did not drink. Alcohol reduced precisely those abilities that are especially necessary for learning the "scientific truths" taught at school: attention is weakened, the ability to make associations is lost, all thinking processes are slowed down, the fruits of recent successes are destroyed, and the ability to make up for what has been lost through exercise is lost [23]. Mental exhaustion, lack of interest, aversion to physical and mental work were characteristic features of school-age children who drink alcohol, according to the observations of domestic and foreign doctors of that time [6].

When it came to the behaviour and morals of students, it was recognised that alcohol had another very harmful function in relation to the adolescent organism. In adolescence, during the period of discovery of sexual desires, alcohol simultaneously paralyses the will, inhibitory centres and excites the sexual sphere. The famous syphilidologist V.M. Tarnovsky (1837–1906) on the basis of his numerous observations stated that the greatest part of cases of loss of chastity by young men occurs under the influence of wine, that the majority of young people become infected with syphilis while in a state of greater or lesser intoxication [52]. Most of the young people cross the threshold of the houses of tolerance for the first time while in the throes of intoxication. According to Dr D.P. Nikolsky (1855–1918), one of the important and severe consequences of student drinking is visiting brothels, prostitutes, which results in infection with venereal diseases [35].

In fact, doctors observing the pathology of alcoholics noticed that very often the diagnosis of alcoholism was accompanied by **venereal diseases**. The spread of venereal diseases and, above all, syphilis, was facilitated by drunkenness, which was directly related to debauchery and prostitution. These phenomena were also favoured by an increase in the mobility of the population and the number of urban dwellers, the growth of factory and factory industry, and the development of migrant trades, which forced peasants and bourgeoisie to engage in trades outside their place of permanent residence in search of income. From large cities, villages and factories, peasants brought syphilis into their families. With the low level of people's welfare and the absence of a system of medical and sanitary organisation, the detection and treatment of venereal diseases was imperfect. The introduction, at the initiative of the government, of medical and police control over prostitution, considered the main source of syphilis, did not always lead to favourable results. According to the data given by the sworn attorney and public figure

D.N. Borodin (1855? — ?), 63% of women began to engage in prostitution at the age of 15 to 20 years; 10,2% — under 15 years; but there were also under 12 years old [3]. M.I. Pokrovskaya (1852 — after 1917), one of the first women doctors, named the reasons for this phenomenon: vagrancy of children left by their parents at the mercy of fate, orphanhood, lack of supervision and control over children, idleness, begging. An important role in the first fall of a young girl is played by "a bad family, bad relatives, often pushing her into prostitution. Insufficient earnings and poverty often encourage a young girl to give herself over to prostitution" [38].

Many public figures and doctors recognised that alcohol has a very harmful effect on the adolescent organism. A.M. Korovin on the basis of his large-scale observations in hospitals for alcoholics pointed out that there was a very close correlation between the first intoxication, the beginning of smoking and the beginning of sexual life [28].

Syphilis affected people regardless of social class, sex, and age. It was found that among the intelligence 24% "are already at the mercy of this terrible scourge of the human race" [3]. Syphilis also affected children. D.N. Borodin wrote in his book: "In hospitals, where patients infected with a «nasty» disease lie, everywhere you can meet young children" [7].

The beginning of purposeful study of syphilis dates back to the second half of the nineteenth century. Its founder is considered to be Professor V.M. Tarnovsky of the Medical and Surgical Academy, the author of monographs and manuals on the study of ways of syphilis infection, the influence of parental syphilis on offspring, general pathology, clinical picture, treatment of syphilis and other venereal diseases. In 1863 he published his lectures "Recognition of venereal diseases in women and children", the result of his many years of research [54]. However, this work was so thorough that in 1868 he defended his dissertation for the title of Doctor of Medicine at the Medical and Surgical Academy. At that time, it was the first original work in Russia on syphilis in women and children.

In the second half of the nineteenth century, physicians began to study the incidence of syphilis. In 1882, a pupil of V.M. Tarnovsky, the first female venereologist, Z.Y. Yeltsina (1854–1927), was invited as a temporary doctor to Krapivensky district of Tula province. Observing the spread of syphilis among the peasant population, sources of infection and ways of transmission, she came to the conclusion that "not only whole families often fall ill and become in turn hotbeds of infection for others, but even whole villages and hamlets can be taken over completely" [20]. In the following year 1883 Z.Y. Yeltsina examined 1370 peasant families consisting of 5475 people. Among them she found 413 children and 314 women with syphilis from 276 families. According to her data, the incidence of syphilis among children was 12.04% and among women — 14.05%. Z.Y. Yeltsina confirmed the opinion of her teacher V.M. Tarnovsky that a special kind of syphilis, the so-called household or innocent syphilis, prevailed in the countryside [53].

Interesting data were obtained by a doctor N.S. Speransky (1857–1909), who studied the incidence of syphilis in Moscow Governorate for the period from 1880 to 1897 on the basis of data from the medical and statistical bureau. He came to the conclusion that syphilis was more often contracted and diseased not by men, but by women. Infectious forms were most widespread among children, with children accounting for 37.5% of the detected syphilis patients; married people contracted syphilis more often than single people. These data confirmed the popular belief that the spread of syphilis was not primarily sexual, but rather domestic and through all kinds of contact between patients and healthy people living closely together [51].

A.G. Ge (1842–1907), a student of V.M. Tarnovsky, associate professor at Kazan University, consultant of the syphilidological department of the Kazan zemstvo hospital, attributed a major role in the spread of syphilis to the life of peasants who lived in crowded conditions, ate from the same dishes, widely used chewed bread or vegetables wrapped in rags as dummies, fed the same to older children, kissed them, etc. [10]. For the most part, villagers did not know and did not understand the essence of the disease, ways of syphilis infection, treated it quite simply, as an ordinary disease, like a cold, scrofula, treated with conspiracies and folk medicine.

The possibility of transmission of syphilis from parents to children has long been known to doctors, described many cases of birth of a child already with manifestations of syphilis. It was found that the infection occurs in the womb, and the cause of this infection is syphilis parents. In-

fection of the child may also occur during labour and through the milk of an infected mother.

According to D.N. Borodin, at least 71 per cent of pregnant syphilis patients gave birth to stillborn infants or children who died in the first year of life. In some places this figure reached 86 per cent. Doctors noted that by the end of the XIX century the disease began to affect earlier age — from 15 to 20 years, "the best hope of every family, society, state" [3].

Drunkenness contributed to the marginalisation of people, destroyed families, predisposed to various forms of deviant behaviour. All psychiatrists and criminologists recognised a close etiological link between alcoholism and crime in its various types. In the already mentioned dissertation of N.I. Frontkovsky there is information based on the analysis of the data of accounting of diseases and deviation of the population for 1901, where, in particular, it is shown that hereditary alcoholism was the cause of chronic drunkenness (32.7%), crime (26.9%), dementia (65.4%), prostitution (37.0%) [57].

Statistical data for St. Petersburg in 1866–1904 showed that among all suicides drunkards were 25.6% of men and 14.0% of women [15]. D.N. Borodin wrote a lot on this topic, revealing in his speeches the government policy aimed at obtaining "drinking" income. In a report at the First All-Russian Congress devoted to the fight against drunkenness, he said: "No vice is not spread in such huge proportions as drunkenness and no one does not upset so often family peace, does not expose poverty and disease, and does not entail a tendency to madness, crime and suicide ... In general, the passion for wine can humiliate a person to an incredible extent" [4]. He noted that in cities, especially in large cities, suicide is developed in colossal proportions, and cited the following data for the beginning of the XX century: in Berlin — over 300 suicides per 1 million inhabitants, in the provinces — only 150; in Paris and Vienna — over 400, in St. Petersburg — 200, in the other regions of Russia — only 30. But every year this number increased. From 1902 to 1910 the number of suicides in European Russia increased by 36%, and in Moscow province — by 162%. The number of child suicides also increased. D.N. Borodin believed that the more widespread the use of alcoholic beverages in any area, the more frequent are suicides there [5].

At IV department on hygiene of upbringing and education of Russian Society for Protection of Public Health in the beginning of XX century the Commission on school suicides was created. According to this commission, the number of school suicides year by year increased. If in 1904 for every 100 thousand students in secondary schools there were 5.8 suicides, in 1909 there were 16 [22]. This was confirmed by the studies of other authors. Thus, it was pointed out that during 1904–1912 in St. Petersburg there was an increase in suicides among children and youth under 20 years of age. In 1904–1905 — 10%; in 1906–1907 — 11%; in 1912 — 18%. Thus, for 8 years the share of children and young men in the total number of suicides almost doubled [13].

The connection with the development of alcoholism and deviant behaviour in childhood and adolescence was tried to be explained by their age-related psychophysiological features. The scientist-hygienist G.V. Khlopin (1863–1929) pointed out that "15–16 years is a critical age in the development of boys, when the transition from childhood to adolescence is made. The process of growth and maturation so weakens the nervous system, disturbs the balance of mental and bodily forces that the boy's organism is mentally extremely easily woundable. Boys of this age react extremely strongly and sharply to external impressions. The ability to work in these years in many of them is sharply reduced, often mental abilities and character deteriorate" [58]. In girls, changes in the body at the onset of puberty occur faster and are expressed much more sharply than in boys. The special condition of the whole mental state of a teenager was also confirmed by the observations of the paediatrician A.E. Gippius (1851–?) [11].

M.Ya. Fenomenov (1883–?), the author of the book "Causes of Suicides in Russian School" (1914), also named alcohol consumption among the reasons predisposing to suicide [56]. In his opinion, acute intoxication may be one of the last impulses for a person who contemplates suicide; chronic alcoholism is one of the most important predisposing conditions. A large percentage of school suicides were attributed to mental and nervous illnesses. M.Ya. Fenomenov wrote: "The degenerate children, children of alcoholics, mentally ill, syphilitics, are the first candidates for mental illness, and also for suicide. Of course, suicide is not a disease and is not inherited, but the psychopathic constitution is transmitted, in which a person is extremely vulnerable. The slightest nudge can cause him

to take his own life. The latter can easily happen in childhood, either in or out of school. Letters of juvenile suicides (students) often paint us their morbid natures as some casual visitors to this world, who «seem to have been waiting for the first opportunity to leave it". He cited the figure that 43% of suicides in secondary schools are due to illness [56].

V.Ya. Kanel gave an unflattering assessment of the school: "The school undermines the physical and spiritual strength of its pupils, deprives them of stability and the necessary energy. Alcoholism is only one of the symptoms of that heavy disease, which our schools are obsessed with. The use of alcoholic drinks by pupils represents only one of the consequences of physical weakness and mental emptiness, which serve as the sad lot of schoolchildren" [23]. And here is how one of the founders of school hygiene, Dr A.S. Virenius (1832–1910), characterised school conditions: "What is a student? It is a young representative of mental labour who spends most of his time sitting in a sitting position of the body in an unsanitary school and teaching environment under the influence of moral oppression and a bureaucratic, formal attitude to business". Violation of the elementary rules of sanitation, drab everyday life of a pupil, deprived of any interest, forcing to seek acute fleeting pleasures, weakening "the vital activity of the young organism; nervousness, moral unbalance, suppression of will and character — all this leads to the fact that «the pupils involuntarily drink with their companies at home or go secretly to the inn, satisfying there the only available for them "social" aspirations and trying at least for a moment to part with the endless and, it seemed, hopeless longing" [9]. As a result of these conditions of school life all authors called the growth of the number of suicides among students and the fact that among them "alcohol is in great favour". The school, doing nothing to eradicate bad habits, "becomes guilty of children's vices, their aspirations to abnormal stimuli and harmful pleasures" [23].

A.M. Korovin called the child's family a contributing factor in deviant behaviour: "If anyone, like us, has seen many degenerate and alcoholic families, he could undoubtedly note the disgusting and highly destructive moral atmosphere reigning in them. Such an environment is in children a direct cause of mental illness" [25].

Child mortality. It It is now established that the most severe consequence of alcohol consumption and the most integral indicator of the severity of alcohol problems is the mortality of children. In the last quarter of the 19th century, the data were obtained confirming the influence of parental alcoholism on the child mortality rate. In pre-revolutionary Russia it reached horrifying levels — on average 260–300 out of 1 thousand newborns did not live up to 1 year. In European countries at the end of the XIX century this indicator averaged 200%, and after the introduction of state regulation of the sale of alcoholic beverages it decreased in Denmark to 120%, in Ireland — to 100%, in Sweden — to 90%, in Norway — to 80% [60].

As far back as January 1886, a special commission was set up at the Ministry of Internal Affairs under the presidency of S.P. Botkin (1832–1889) to improve sanitary conditions and reduce the mortality rate in Russia. The Commission, of course, could not pass by the issue of child mortality. S.P. Botkin sent letters to various scientific societies, famous scientists and doctors, including paediatricians, with questions about the causes of high mortality. During three years (1886–1889) the journal "An International Clinic" published S.P. Botkin's letters and answers of famous doctors. Paediatricians N.F. Filatov, K.A. Raukhfus, V.N. Reitz and others responded to S.P. Botkin's enquiries about child mortality. The St. Petersburg Society of Paediatricians established a special commission under the leadership of N.I. Bystrov to draft a response to the enquiry, in which a great deal of attention was paid to the social conditions contributing to high morbidity and child mortality [39]. Among the etiological moments, along with poor health of parents, hard work, especially for women, lack of knowledge of hygiene and dietetics of childhood, lack of educated midwives and medical assistance in general, poor nutrition, unhygienic living conditions, alcohol abuse took one of the first places.

Of course, the child mortality rate was influenced by many social factors — the father's money, the mother's work, the degree of culture of the family, but alcohol also plays a role in this regard. The famous paediatrician, the first Russian neonatologist V.P. Zhukovsky (1861–1938) pointed out that parental alcoholism has a particularly detrimental effect on the health of the newborn, reduces fertility and increases mortality of children [21].

The psychiatrist I.A. Sikorsky (1842–1919), based on a study of extensive statistical data on the mortality of infants from birth to five years of age in European Russia for the period from 1867 to 1881, developed by the Central Statistical Committee of the Ministry of the Interior, concluded that in those areas of European Russia where wine consumption was higher, there were higher rates of infant mortality and infanticide, and more crimes of all kinds were recorded, with the increase in crime being related not to population growth but to strain. In the metropolitan and so-called middle industrial provinces, infant mortality in the first year far exceeded the average mortality rate. I.A. Sikorsky cited the following figures: the average mortality of infants in Russia in the first year is 27.1%, while in the capital provinces it was 38.3%, and in the medium industrial provinces — 34.8%. Such a high mortality rate he attributed to the usual shortcomings and bad influence of large cities and industrial centres on the health of the infant population during the period of breast-feeding. I.A. Sikorsky wrote "there remains no doubt that alcoholic beverages lower the effect of parental and kinship duty and weaken the strength and degree of those altruistic feelings and that family beginning which binds people together and thereby secures the interests of mutual self-preservation. Undoubtedly, such undermining of the family foundation cannot but have a harmful effect in a wider sphere, i.e. on the interests of the great family — society" [50].

N.I. Grigoriev, who worked as a Duma doctor "among ordinary people, among craftsmen, factory workers, small traders, in close contact with their families", did not ignore the environment of family life and the quality of child care [14]. He noticed that in families where there were no alcoholic parents, children were healthier and less often ill. He concludes that in the enormous mortality rate of children under 1 year of age, "alcoholism of parents plays a huge role, especially among the common people living in St. Petersburg, with such a terrible environment, which, perhaps, in the village have no idea. In addition, the wives of alcoholics did not hesitate to confess to us that all their children were born of drunken husbands, that they were conceived at the moment when their father was drunk" [16].

Later, N.I. Grigoriev repeatedly drew public attention to this issue, constantly confirming the conclusions of his previous works.

Also of interest are the results of a survey of St. Petersburg workers, conducted in 1911, which showed that more children die in drinking families than in non-drinking families. In families where the wife did the housework while the father was drinking, the mortality rate was 24.6%, while with sober parents the child mortality rate was 20.2%. Precisely because the survey concerned children of the same social group and the mother's occupation was taken into account, it is possible to accept the results as reliable and to consider that alcohol "contributes to the terrible cause of premature death of hundreds, thousands of children" [23]. I.V. Sazhin in his book also cited data which stating that "a huge comparatively figure of mortality among children in the districts where distilleries exist" [48].

Measures proposed to reduce the scourge called "child alcoholism". It should be noted that quite a lot was written and said on this problem at that time, and, undoubtedly, it requires a separate study. Here we will name only the main directions of this activity.

Taking into account that often the introduction of a pregnant or nursing mother, a child or a young man to alcohol as a therapeutic remedy took place with the assistance of a doctor, there were proposals to introduce the legislative responsibility of a doctor to the society "languishing under the weight of modern alcoholism". It was emphasised that it was the duty of doctors to explain to their patients and the public in general, by the power of their authority, how dangerous the uncontrolled use of alcoholic drinks in everyday life was, and to protest that pregnant and nursing women should use alcohol at their own discretion and parents should give it to their children, for whatever purpose.

In 1898, the Russian Society for the Preservation of Public Health (RSPPH) organised a special commission to combat alcoholism, which included a school section headed by the famous lawyer, Professor D.A. Dril (1846–1910). The activities of this commission were mainly oriented towards studying the spread and causes of drunkenness among pupils and identifying the influence of alcohol on the physical and moral development of schoolchildren.

It should be said that the Russian Orthodox clergy was actively involved in the fight against drunkenness, participated in the All- Russian anti-alcohol movement and was the initiator of many initiatives in this direction. The Orthodox

clergy took a particularly large part in the organisation of temperance societies. The definition of the Holy Synod of 1889 explicitly called on the clergy to establish temperance societies, parish trusteeships, fraternities and other similar institutions in order to affirm the sober way of life in the people by word and sermon. There were dozens of temperance societies in Russia, whose tasks included dissemination of information about the harm of drunkenness through talks and brochures, arrangement of tea houses, as well as popular entertainment. The Alexander Nevsky Society of Sobriety in St. Petersburg opened in 1898 at the Resurrection Church near the Warsaw railway station, served as a model for them. Of interest is the Sergievsky branch of the St. Petersburg Alexander Nevsky Sobriety Society, established in 1904 at the Trinity-Sergius Hermitage. Here classes were held with children, talks were held about the harm of drunkenness, the benefits of sobriety, and then a school was organised. The organiser of this department the hieromonk of Sergiev Monastery Pavel (Gorshkov) (1867–1950) defined the aim of the school as follows: "I set not only to teach children literacy, but also to protect them by all means from the vice of drunkenness. The whole system of education in the school consists in convincing students of the harm caused by strong drinks. It is carried out in anti-alcoholic teaching, which instils in children an aversion to alcoholic beverages" [18]. Up to 300 children between the ages of 8 and 16 were on the school's radar. After graduation, they could continue their studies in special educational institutions or were helped to find jobs.

The ideas of charity, upbringing and education combined the institutions created by the great ascetic of the temperance movement, Saint Righteous Ivan of Kronstadt. In the first Russian Labour House, which he organised in 1882, functioned a public canteen, a children's library at an elementary school, a Sunday school, a shelter for orphans and a day shelter for incoming children, a shelter for minors of both sexes, workshops for boys, and so on. Subsequently, similar institutions were opened in many other cities of Russia on the model of this Labour House.

A great importance in the popularisation of sobriety was assigned to the school, which should become "an instrument of struggle against drunkenness". At first it seemed easy and extremely useful. But gradually the doubt crept in whether propaganda alone was really enough, and whether it was properly organised. After extensive discussion it was recognised "that preaching in its present formulation" was doing harm instead of good. "Exclusive action on the imagination, description of all sorts of horrors, unnecessary thickening of colours was considered certainly harmful, because such teaching of anti-alcohol truths loses its scientific character, ceases to meet the actual state of affairs, leads to scepticism, narrows the horizon and discourages the desire to delve deeper into the subject" [23].

It was realised that drunkenness and alcoholism were social evils that needed knowledge, not preachy speeches and intimidation, to combat. Alcoholism control came to be seen as part of public health. It was recognised that the presentation of the consequences of alcohol abuse should be given only in connection with the general fundamentals of hygiene. Talks should be conducted by specialists who should not obscure the social causes of the scourge or place all responsibility on the individual drinker, as this does not correspond to the substance of the case and creates a wrong view of alcoholics among the students themselves.

Proposals were made to radically restructure school life, «to change the systems of education and upbringing, to form a different view of pupils as extremely lively and impressionable people who need to be approached, not as mannequins who play their roles without complaint. It is necessary to try to develop personality in students and to respect this personality, to awaken in them "lively interests that would capture them entirely, it is necessary to show them the world full of beauty and charm, it is necessary to teach them to enjoy without wine" [23].

They also spoke about the authority of the teacher, about the scientificity of his teaching, truthfulness in covering the issues raised, the need to conduct physical, mental and moral education of students in such a way that they themselves would be a conductor of health, hygiene and morality in society. The teachers duties included work with parents — to impress upon them the importance of educating their children in the spirit of sobriety and abstinence. The fight against routine and school formalism was regarded as the most sensitive blow against drunkenness.

All these considerations, of course, could not be immediately put into action. But they became the subject of active discussion in social

and pedagogical communities, at various congresses with the participation of a wide range of public figures, at meetings of various commissions, as well as at the level of ministries.

A call was made to immediately start fighting the development of alcoholism among children and adolescents. Dr I.V. Sazhin wrote about it: "The great duty and high duty before the motherland and future generations — vigorously, unanimously enter the fight against the so rapidly growing scourge of alcoholism. First of all, doctors, then parents, educators, teachers, public figures and, finally, all those who care about the progress and improvement of future generations should be imbued with the consciousness of the urgency and necessity of this struggle! It is necessary that the extracted and established by science data about the true properties of alcoholic beverages with their sharp, bright rays dispelled the darkness of alcoholic prejudices and would bring into society the beginning of a firm inoculation of anti-drinking habits" [48].

In 1909 The Ministry of Public Education alarmed by the received information about the increasing passion for alcohol among pupils, recommended that secondary schools acquire models of internal organs altered under the influence of alcohol, so that the pupils could see what destructions the poison produces in the organism, and then the terrible picture would scare them away from alcohol consumption. A special commission was set up within the Ministry to work out special measures against the spread of alcoholism among students.

During this period, both abroad and in Russia, there was much talk about medical sanitary supervision in schools. It was stressed that it should not be understood in a narrow sense as only taking measures against the spread of contagious diseases, but that this supervision should concern the entire physiological development of pupils, as well as the correspondence between mental development and physical condition of each of them. In 1913, a circular was issued by the Superintendent and Trustee of the St. Petersburg Educational District on the duties of school doctors and the strengthening of medical and sanitary supervision in educational institutions.

The importance and necessity of preventive work in schools was pointed out by the delegates of the First All-Russian Congress on the fight against drunkenness, which took place from 28th December 1909 to 6th January 1910 in St. Petersburg. Two speeches on school alcoholism were read at the congress. In addition, four speeches touched upon the necessity of introducing the doctrine of sobriety as a special subject at school, as well as extracurricular education as a means of fighting alcoholism.

The congress heard an informative report of an active fighter against alcoholism, teacher I.P. Mordvinov (1871–1925) "Teaching about sobriety in primary schools". He noted that work with children is much more effective than among adults who already have a "track record" of drinking [33]. He insisted on the immediate legislative introduction of a special systematic course of teaching about sobriety in all schools, and he also urgently proposed the training of public teachers. He proposed a programme for a course of sobriety teaching sufficient in content for elementary schools of all types. His proposals were included in the resolutions of the Congress: "To introduce as a separate subject the compulsory teaching of sobriety in lower and secondary schools" [40]. The Congress also drew the special attention of parents, and especially mothers, to the sad fact of alcohol consumption in early childhood, which can "become fatal in the future life of their favourites" [39].

In Moscow in 1910 on the initiative of doctors of medicine A.A. Kornilov (1855–1926) and T.I. Vyazemsky (1857–1914), teacher G.F. Markov (1848-?) and archpriest N.A. Lyubimov (1858–1924) a « Club of figures to combat school alcoholism» was established. This club included the Moscow University professor pharmacologist S.I. Chirvinsky, psychiatrist A.M. Korovin, school doctor N.A. Flerov and others. Its aim was to spread knowledge on alcoholism among teachers by giving them lectures [61].

In addition, in 1910 The Holy Synod by its decree introduced the teaching of the science of sobriety in all parochial schools. In November 1911 The Moscow City Duma appealed to the "Club of Workers to Combat School Alcoholism" with a request to develop a programme for pastoral courses, for church-parochial two-class schools and for the pupils of the senior classes of the women's teacher's seminary. Such a programme was developed and sent to various educational institutions. It was also the basis of the programme of free courses on "The Science of Sobriety" organised by the members of the "Club of Workers against School Alcoholism" in Moscow. From the 1st December of

1911 in Moscow on the basis of this programme courses on "anti-alcoholism" were organised for pastoral courses, for church-parochial two-class schools and for pupils of senior classes of the women's teacher's seminary.

At the All-Russian Congress of Practical Workers against Alcoholism held in Moscow on 6th to 12th August 1912, one of the programme sections was devoted to the problems of school alcoholism and measures to combat it, as well as to the fight against popular alcoholism through schools. The congress was organised by the Russian Orthodox Church on the initiative of the Alexander Nevsky Sobriety Society and the Moscow Diocesan Society for Combating Public Drunkenness with the blessing of the Holy Synod. At this congress, 10 works were presented, dealing with the questions of teaching the sobriety in Russian schools. In some other reports the authors also spoke about these issues.

In the researches of the Congress the report of G.F. Markov "Scientific and educational activity in the fight against alcoholism" stands out. In this report the question of teaching the doctrine of sobriety in Russian schools was presented most thoroughly. Recognising that "the evil of alcohol is so great, so widespread and so terrible, in order to combat it it is necessary to put forward accurate, substantiated knowledge, a special science — the science of sobriety, which should take a prominent, independent place among the general educational sciences" [30].

G.F. Markov proposed his programme of the science of sobriety. In his opinion, the propaganda of the ideas of sobriety should not be limited to the teaching of the relevant subject at school. He assigned a great role to teachers, who should organise anti-alcohol museums and travelling anti-alcohol exhibitions containing everything that clearly indicates the results of the influence of alcohol.

In the resolutions of this congress a whole section was devoted to the teaching and education of sobriety at school as a special independent school subject, and not as a department of school hygiene. A special role was assigned to teachers not only as pedagogues but also as educators; it was emphasised that a teacher of the science of temperance should be an unconditional teetotaller. It was suggested that in order to train a cohort of such teachers, it was necessary to introduce the teaching of this science in all educational institutions that train teachers, as well as in special courses on this subject and in the course of lectures at pedagogical and singing courses.

It should be noted that in the schools of the Ministry of Public Enlightenment only since 1914 it was prescribed to teach students of senior classes a course of hygiene with obligatory information about the harm of alcohol for one hour weekly during the year.

The problems of alcoholism, including children's alcoholism, were discussed at the Congresses of the Society of Russian Doctors in memory of N.I. Pirogov, which played a huge role in shaping the society's opinion on topical social issues. Thus, at the VIII Pirogov's Congress (1902) they were considered at the joint meetings of the section of nervous and mental diseases and the section of zemstvo and urban medicine.

In the resolutions of the IX Pirogov's Congress (1904) on the section "Mental and nervous diseases" the participants of the Congress assessed the governmental policy in relation to alcoholism: "The state wine monopoly, being a source of budget replenishment, not only does not prevent, but, on the contrary, promotes the development of alcoholism in Russia". And in the section "Public Medicine" Pirogov's Society was even more categorical: "The correct and expedient fight against child mortality, alcoholism, tuberculosis, syphilis and other folk diseases, which are a public disaster of great importance in Russia, is possible only under conditions that provide a wide dissemination of information about the true causes of their development and ways to combat them, which requires freedom of the individual, speech, press and assembly" [19].

At the XI Pirogov Congress (1913), the problem of combating alcoholism in children was discussed at the section of paediatric disease. The issue of the influence of alcohol on the ability of mothers to feed their children was discussed.

"I repeat, if we are not sober, we will soon be depersonalised and wiped off the face of our native land", — warned the deputy of the State Duma, a large Samara businessman and public figure M.D. Chelyshev (1866–1915) [59]. On his initiative in the III State Duma was created "Commission on measures to combat drunkenness" (1907–1912), which became the centre of the development of anti-alcohol law in Russia. On 16th November 1911 at the fifth session of

the III State Duma was approved an anti-alcohol bill, which provided for restrictive and educational measures against vodka, in particular: "...places of sale of alcohol could be located: in the capital and provincial cities — no closer than 85 meters, and in other areas — no closer than 213 meters from churches and educational institutions of all types; in all primary, secondary and pedagogical educational institutions students should be informed about the harm caused by the use of alcoholic drinks" [36].

The adopted anti-alcoholic bill was submitted to the State Council, where the influence of landlords and wine merchants was strong. It had been discussed for several years and, finally, in 1914 it was returned to the IV State Duma for revision, but it never gained the force of law [1].

At the beginning of the twentieth century, doctors and public figures clearly pointed out the connection between alcoholism and socio-economic conditions of life in Russia. This idea was clearly expressed in the speech of psychiatrist, Professor M.N. Nizhegorodtsev (1851–1919), chairman of the commission on alcoholism and measures to combat it of the Russian Society for the Preservation of Public Health [2]. Recognising that alcoholism leads to the degeneration of society as a whole, the growth of crime and suicide, he called for a fight against the socio-economic conditions that cause alcoholism. Children from the first steps of their life journey are influenced by the totality of the conditions of life of the working people, the whole mass of harmful influences: hygienic disadvantage and incredible overcrowding in the premises, family environment created on the basis of need and deprivation, desperate exploitation of labour, all this undermines the physical strength and destroys the moral foundations of the younger generation.

It has been established by many authors that insufficient nutrition of the masses is one of the causes of alcoholism. Full nutrition is especially important for the growing organism, but many children were malnourished. Here are excerpts from the report of M.G. Kotelnikov, a member of the Commission on Combating Alcoholism at the First All-Russian Congress on Combating Drunkenness, in which he wrote the following statement about pupils: only 4% of them were satisfied with a piece of dry bread, or tea without milk, or empty coffee; 10% went to school with an empty stomach; 41% had only dry bread for breakfast; 12.6%, returning home, had nothing but tea, bread, or empty coffee; and some did not eat lunch or dinner at all. Only 4% are eating normally, 53% are chronically malnourished, and 32.6% are completely meat deprived [29].

It was recognised that improved nutrition would do more to turn the younger generation away from alcohol than even the most fervent sermon or vow of abstinence.

It was no accident that the most serious attention of the Russian public was drawn to this medical and social phenomenon. More and more loudly public figures spoke of the need to take measures of a state nature in the fight against alcoholism of adults and children. Here is how D.N. Borodin wrote: "The problem of children's alcoholism is a matter of state, standing in the first place, this question is connected with the economic, physical and moral development of the people" [6].

The facts collected for the period of the late XIX — early XX century in the brightest colours testified to the harmful effect of alcohol on children's health. The refrain in all publications and speeches was the idea of inadmissibility of alcohol consumption by children, evidence of its harmful effect on physical and mental development, as well as on the social behaviour of the child.

Studies have shown that drinking goes along with crime, poverty, debauchery and the destruction of the family home. It also causes a wide variety of diseases, not only for the drinker but also for their offspring. Drunkenness shortens the lives of drinkers and their children, causes suicides and accidents, often resulting in death.

One of the most devastating consequences of drunkenness has been identified as the destruction of the family. In those families where alcoholic beverages find enthusiastic adherents, there can be no question of peace and harmony, of proper and successful upbringing of children. They grow up without supervision and attention, without affection and care, and usually children of alcoholics are early acquainted with crime. Backward children, idiot children, crippled children, children deprived of their mother's affection and love, street children, alcoholic children — all these were regarded as a living reproach to the existing society and system of life!

At the beginning of the twentieth century, when there were numerous scientific studies on the scale of this phenomenon, the impact of alcohol on children's bodies, the troubles of life

to which it leads, views began to form on the need to develop and take more effective measures to combat alcoholism. There was no doubt that alcoholism was closely linked to the socio-economic conditions of the Russian population.

However, no complete programme aimed at fighting this evil had been created. It was realised that public efforts alone were ineffective and could not influence the whole complex of causes leading to drunkenness. More and more often there were appeals for the participation of the government in this fight.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

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CURRENT STATUS AND MAIN ORGANIZATIONAL PROBLEMS OF MEDICAL CARE FOR NEWBORN

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ABSTRACT. The most important trend of national policy, both in the Russian Federation and in most countries of the world, is to stimulate healthy pregnancy and maintain the health of newborns, especially in the first month of life. The health care of Russia has improved the obstetric service, following the example of the obstetric and neonatological medical care system existing in the world developed countries, which has made a positive effect on reducing perinatal mortality and neonatal morbidity. The system of organizing medical care for pregnant women, women in childbirth, puerperas and newborns in Russia has a number of features, which are primarily due to the specifics of particular regions. Among the main problems in the organization of medical care for newborns are difference in economic development, the availability of medical care and staff of the neonatological service of obstetric organizations in the constituent entities of the Russian Federation, as well as the violation of the routing of pregnant women, women in childbirth, puerperas and newborns. The studied literature data allowed us to conclude that improving organization and quality of neonatological care in current demographic, economic and social conditions in Russia is of vital importance, and this fact caused the scientific interest of this study.

KEY WORDS: newborns; obstetric organizations; organization of medical care for newborns; infant mortality; perinatal mortality; neonatal morbidity.

СОВРЕМЕННОЕ СОСТОЯНИЕ И ОСНОВНЫЕ ОРГАНИЗАЦИОННЫЕ ПРОБЛЕМЫ МЕДИЦИНСКОЙ ПОМОЩИ НОВОРОЖДЕННЫМ

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РЕЗЮМЕ. Наиважнейшим направлением национальной политики как Российской Федерации, так и большинства стран мира, является стимулирование здоровой беременности и сохранение здоровья новорожденных, особенно в первый месяц жизни. Здравоохранение России усовершенствовало службу родовспоможения по примеру системы оказания акушерской и неонатологической медицинской помощи, используемой в развитых странах мира, что положительно отразилось на уменьшении показателей перинатальной летальности и неонатальной заболеваемости. Система организации медицинской помощи беременным, роженицам, родильницам и новорожденным в России имеет ряд особенностей, которые в первую очередь обусловлены спецификой отдельных регионов. Среди основных проблем организации медицинской помощи новорожденным можно назвать различный уровень экономического развития, доступности медицинской помощи и кадрового обеспечения неонатологической службы организаций родовспоможения субъектов Российской Федерации, а также нарушение маршрутизации беременных, рожениц, родильниц и новорожденных. Изученные литературные данные позволили сделать заключение о важности улучшения организации и повышения качества неонатологической помощи, так как в сложившихся в России демографических, экономических и социальных условиях это приобретает жизненно важное значение, что и предопределило научный интерес к данному исследованию.

КЛЮЧЕВЫЕ СЛОВА: новорожденные; организации родовспоможения; организация медицинской помощи новорожденным; младенческая смертность; перинатальная смертность; заболеваемость новорожденных.

The main objectives of neonatology are to find the best diagnostic and therapeutic methods for diseases in children during a newborn period, to develop rehabilitation measures for sick children and to create in the neonatal period a foundation for the health of their entire subsequent life. It has been noted that both primary and secondary prevention mesures of many chronic diseases are most effective in the perinatal period (from the 22nd week of pregnancy to the first week of life incl.).

Thus, neonatology is a young science of nursing children of the first four weeks of life, which is one of the parts of pediatrics. Neonatology as a special science was formed in the XX century, i.e. in the recent past in contrast to pediatrics. The demographic significance of the perinatal period of newborn life is invaluable for the birth of healthy children, who are the health reserve of any country [4, 25, 42]. It should be noted that family health and quality of life in the community have a great impact on the intrauterine and early neonatal development of each child, which is especially relevant for Russia, where is a low birth rate [47].

Important areas of national policy both in the Russian Federation and in many countries of the European Community are the promotion of healthy pregnancy and preservation of newborn health, especially in the first month of life. The main indicators of this policy are perinatal and infant mortality rates. A decrease in the level of the indicators not only provides an assessment of the degree of reproductive health

of population, but also indicates the quality of both obstetric and neonatal care, which proves the dependence of health of pregnant women and newborns on the organization of these types of medical care [2, 10, 48].

Poor management of pregnancy and obstetrics can lead to serious consequences for health of a woman and child, lead to morbidity and disability of children. In the literature, it is noted that perinatal causes are almost 80% of causes in childhood disability. Many authors note that the health status of children is in direct correlation with the morbidity of their mothers during pregnancy. It is noted that the frequency of intrauterine developmental delays, neuropsychiatric disorders, and hypoxic damage to the central nervous system increases in newborns [5, 25, 51].

Insufficient weight gain of a pregnant woman is also one of the risk factors for the development of perinatal pathology, because insufficient trophic function of a maternal body leads to placental insufficiency and delayed fetal development [17].

Diseases of all organ systems and obstetric pathological conditions in pregnant women have a serious impact on the increase in neonatal morbidity [7, 40]. The presence of anaemia and pre-eclampsia in these women contribute to the development of perinatal fetal pathology due to the formation of placental insufficiency.

Many literature sources indicate the negative impact of birth trauma on health of newborns. The breech presentation of the fetus is the most common cause of birth trauma. Birth trauma is also caused by anomalies of labor, the use of obstetric forceps and uterotonic agents [1, 14, 40].

It is pointed out that the reason for decrease in the quality of obstetric care is the factor of obstetric aggression, which leads not only to complications of labor, but also perinatal pathology. It is noted that the use of uterotonic agents in labor to reduce its duration reaches 60%. The negative effect of a number of drugs used during labor, especially anesthetics with cardiodepressive effect, effect on respiratory function and postnatal adaptation of newborns has been established [34, 38].

Congenital anomalies have significant impact on the morbidity and especially child mortality. According to many authors, the population specific part of this pathology varies from 3 to 7%. At the same time, it increases to 11–18% among stillborns [26, 27].

Number of authors has opinion that children born using assisted reproductive technologies are more likely than those conceived naturally to have such disorders as neonatal asphyxia (more than 90%), half of them have neurological abnormalities, and almost third of them have delayed intrauterine development [23].

A large number of studies conducted and currently ongoing are devoted to the influence of social risk factors on children's health, which include socio-hygienic (household and material conditions, etc.), medical and demographic (age of parents, single-parent family, etc.) and socio-psychological (poor moral and psychological environment of family, unwanted pregnancy, etc.) factors [3, 14, 50].

Chronic arterial hypertension and pre-eclampsia/eclampsia in a pregnant woman, her low level of education and lack of employment, alcohol abuse, smoking, low body weight, and first labor increase the risk of giving birth to a low birth weight premature baby [1, 43]. The most informative indicators of the health of born children are the level and structure of perinatal and infant mortality.

According to WHO, 2.6 million live-born children die in the first month of life worldwide, and an equal number are stillborn. Up to half of deaths cases in live-borns occur in the first 24 hours of life and up to 75% in the first week. WHO notes that the most critical period for the survival of a newborns is the first 48 hours of life [11]. It is noted that the causes of death in children under 5 years of age, 50% of which are newborns, are complications of premature birth, neonatal asphyxia, pneumonia, diarrhea and malaria [12].

Adverse factors that increase the number of preterm births (in combination with poor reproductive history, diseases of other organ systems (not reproductive system) and pregnancy complications) are pregnancy in unmarried women, insufficient education of a mother, lack of employment, smoking and alcohol abuse, and the age of a woman (less than 18 years and over 35 years) [25, 39].

Despite the significant successes of Russian health care in combating infant mortality, there are significant reserves for further reduction of this indicator [43]. As noted by number of authors, reducing losses from respiratory diseases, infectious diseases and other conditions potentially under the control of medical wor-

kers, which account for up to 30% of the causes of infant mortality, will significantly reduce the infant mortality rate [20, 26].

A number of scientists cite data that different efficiency in the provision of medical care to both pregnant, women in childbirth and newborns, social and economic, climatic situation in different regions can lead to regional discrepancies in the perinatal mortality rate [16].

Decompensated chronic placental insufficiency with severe fetal growth retardation, severe prematurity and intrauterine infection contribute most to perinatal mortality. The issue of reducing the number of preventable perinatal deaths is currently one of the main issues in the international work of health authorities [15, 16]. At present, improving ante- and intrapartum diagnosis of fetal condition and implementing the risk strategy is considered a promising direction in perinatology to address the encountered problems. An important point affecting the newborn morbidity and mortality is the incidence of preterm labor, which, according to number of scientists, is a "big obstetric syndrome" [37].

Premature birth is the most significant risk factor for neonatal mortality worldwide. The baby is born immature, resulting in respiratory disorders, central nervous system lesions and intraventricular hemorrhage. In addition, congenital developmental anomalies and perinatal infections are common in such newborns [18].

An increasing number of authors identify respiratory distress syndrome of the newborn among the main causes of mortality of children in the first month of life, which is more often characteristic of premature infants and children born with extremely low body weight and caused by immaturity of the lungs and primary surfactant deficiency [15, 19, 26].

There is an evidence that the leading place in the structure of early neonatal mortality in preterm infants is occupied by intrauterine infection, followed by asphyxia and congenital malformations with associated respiratory distress syndrome. In premature infants, early neonatal mortality is primarily due to respiratory distress syndrome and asphyxia with concomitant intrauterine infection [20].

A study of neonatal health conducted in 2001–2013 showed a high prevalence of pathology among newborns: every third premature newborn is born sick or becomes ill in his first days of life [1].

It should be noted, that increasing time of stay in an inpatient clinic (maternity hospital) more than the minimum time contributes to the reduction of neonatal deaths and saves financial resources in nursing [29]. Increasing the average length of stay of a newborn in hospital (maternity hospital) by 15 hours was accompanied by a 36% drop in the average probability of child death, i.e. the risk of death decreased with each additional hour spent in the hospital (maternity hospital). In a short time, it is impossible to diagnose a number of diseases and timely start effective treatment, so increasing the length of stay in the hospital (maternity hospital) increases the chance of survival of children of the first month of life [13, 44].

The age of mothers, especially young mothers and women from 40 years and older, according to British specialists, is a risk factor for neonatal mortality. In England, children born to mothers over 40 years of age have 1.3 times higher neonatal mortality than children born to women aged 25–29 years [55].

The incidence of stillbirths and neonatal mortality doubles when children are born to obese women with a body mass index of more than 30 [40, 49, 54].

Smoking by women during pregnancy may increase a risk of preterm birth and, consequently, increase a risk of neonatal mortality. A study of the effect of maternal smoking showed that more than 1/3 of preterm infants born to women who smoked had intrauterine developmental delays [3, 17, 45].

The presence in a woman of such chronic diseases as chronic renal failure, arterial hypertension, diabetes mellites, antiphospholipid syndrome, haemoglobinopathy, thrombophilia significantly increases the risk of an unfavorable outcome for her child. Alcohol abuse, drug abuse, and infectious diseases have an extremely negative impact on pregnancy outcome. The risk of neonatal death in multiple pregnancies increases from 2 to 5 times in comparison with singleton pregnancies [8, 15, 40].

As noted above, the risk factor for perinatal and early neonatal mortality is premature birth, which leads to prematurity. Among children who died in the first week of life premature babies account for up to 70%, and among those who died before the age of 1 year — 65–75% [57].

The main fraction of neonatal deaths in preterm births (up to 70%) is accounted for by

babies born with a body weight of 500 to 1000 grams, and perinatal mortality is 10‰. In preterm births, stillbirth rate is significantly higher (8–13 times) than in term births. At the same time, congenital anomalies account for almost a quarter of the causes in the structure of perinatal mortality [18].

The transition of our country in 2012 to the WHO-recommended live birth criteria and deteriorating health of women, especially those of fertile age, provoked an increase in the number of premature births and increase in the number of children born with extremely low birth weight [11, 12, 14].

There is a negative impact of the mortality of children born with extremely low body weight on the medical and demographic situation in the country (region) [53, 54]. The authors indicate that the predominant causes of mortality are intrauterine infections, congenital pneumonia and respiratory distress syndrome [49].

These children have a high incidence of congenital malformations and asphyxia. The prognosis for the future life of surviving children born with extremely low body weight is quite varied: from the absence of pathology to severe disability. For this reason, caring for such children often requires the use of respiratory support and use of modern therapeutic and rehabilitation technologies, constant close monitoring [22, 46].

However, according to N.V. Bashmakova [6], only 10–25% of these children grow up healthy, and the decrease in infant mortality due to nursing of such newborns provokes an increase in child morbidity and disability.

According to the data of the Belgorod State National Research University, the chances of survival of children born with a body weight of up to 500 g are only 11.6%, and with a body weight of 750 g — 83.9%, i.e. the chances of survival in this case increase more than 7 times [10].

The data of authors from foreign economically developed countries show that in the USA about 67% of child mortality up to 1 year of life are premature, more than half of them were born with extremely low body weight. The mortality of children born with a body weight of 500–749 g was 85%, and in newborns with a body weight of 750–1000 g — 49% [53, 55, 57].

In Japan, about 90% of children born with a birth weight of 1500 g or more survive. However, 19% of them have subsequent neurological complications [54].

According to Swedish scientists, 70% of children born between 22–26 weeks of gestation survived (9.8% among those born at 22 weeks and 85% at 26 weeks). It is noted that 45% of the survivors do not have significant somatic and neurological abnormalities [51, 55].

In the last five years, survival rate of children born with extremely low birth weight in Italy has increased to 76% [57]. According to the data of foreign scientists, about 85% of children born with extremely low birth weight who received high-quality medical care in perinatal centers survive and were discharged home. However, depending on the gestational age and body weight of a newborn, this indicator varies [52].

Children born before 25 weeks of gestation and weighing up to 700 g are the most difficult patients. The viability limit zone is considered to be 22–24 weeks of gestation and body weight of 500–600 g. The mortality rate of these newborns remains very high [6, 10, 39]. The survival rate to hospital discharge for infants with a gestational age of 22–24 weeks in the United States was 13%, and for those with a gestational age of 26 weeks or more, it was 70%. At the same time, they subsequently experience severe pathology of the nervous system, 70 and 30%, respectively. About half of the surviving children in the UK at 22–25 weeks' gestation who survived to 6 years of age had moderate or severe neurological pathology [55].

The most promising group of children for reducing perinatal, neonatal and infant mortality are infants born with a gestational age of 24 weeks or more and with weight of 700 g or more. However, the survival rate of these infants is not an adequate criterion for the effectiveness of medical care for these children if they have severe somatic and neurological abnormalities. Survival with severe health consequences should be recognized as an unfavorable outcome; therefore, the search for and implementation of productive prognostic, diagnostic, and organizational methods that allow survivors to have good health and quality of life indicators as they grow up are at the forefront [4, 6].

In the Russian Federation, according to the order of the Ministry of Health care and Social Development of October 2, 2009, No. 808n "On Approval of the Procedure for Providing Ob-

stetric and Gynecological Care", a three-level model of perinatal care was introduced [33].

In order to improve the quality and accessibility of medical care for pregnant women, women in childbirth, puerperas and women in postpartum period , due to the order of the Ministry of Healthcare of the Russian Federation No. 572n of November 1, 2012, the provision of medical care to these women is based on routing sheets, taking into account the degree of risk of complications, structure and bed capacity, level of equipment of each medical organization, and availability of qualified medical staff [35]. In this regard, medical organizations that provide medical care to women during childbirth and postpartum period were divided into three groups. The new order of the Ministry of Healthcare of the Russian Federation of October 20, 2020, No. 1130n "On Approval of the Procedure for the Provision of Medical Care in the Profile of Obstetrics and Gynecology" retains the three-level model of medical care, but regulates its provision with the use of telemedicine technologies [36].

The improvement of obstetrics service was based on the experience of obstetric and neonatal medical care used in developed countries of the world [28]. However, unlike the countries of the European Community (the United Kingdom, the United States and Japan) the organization of such three-level system of medical care for pregnant women, women in childbirth, puerperas and newborns in our country has its own peculiarities, primarily related to the territorial location of obstetric institutions and ethnic traditions. In the European Community, the majority of population (up to 95%) lives within 15–20 minutes' accessibility to third-level medical organizations providing obstetric care [53].

In the USA, up to 82% of women of reproductive age live within 30–60 minutes' drive of a perinatal center. About 80% of UK women live within 30 minutes by car of obstetric unit and 99% within 60 minutes. Accessibility to perinatal centers for women in the Netherlands averages less than 15 minutes in urban settings and more than 20 minutes in rural areas. A study of nine regions in Germany, the United Kingdom, France, Italy, Belgium, Denmark, Portugal and Poland found that the average distance to tertiary care hospitals for half of the women was about 10 km, for a quarter of women — 4.1 km and for 25% of women — almost 80 km [48].

The time for transporting Japanese women to a tertiary obstetric hospital of the third level ranges from 90 to 180 minutes, while air transport takes 15 to 29 minutes [52]. Air transport of pregnant women is used when they are far from an obstetric unit or hospital (more than 3 hours by road) or when ground transportation is not possible. For example, the distance from a obstetric hospital (unit) in rural areas of Northern Australia can be 560–965 km [55].

The restructuring of medical care for pregnant women and newborns in the European Community and North America has led to a reduction in the number of obstetric units [48, 49]. Despite the increased distance from the place of residence to the obstetric facility, the elimination of low-capacity obstetric hospitals (units) did not affect the accessibility of timely obstetric care, which was facilitated by strict adherence to the rules of regionalization of medical care, the use of modern telecommunication technologies and developed transport system of these countries.

In the Russian Federation (in a large number of its constituent entities), unlike in economically developed countries of Europe, the distance from second and especially third level obstetric institutions is on average 70–100 km. Long distances, lack of the developed transportation network, difficulty (and often impossibility) with air transportation, and insufficiently developed telecommunication technologies can negatively affect the health of pregnant women, women in childbirth and newborns. This is extremely important, as it has been proven that transportation for more than 20 minutes increases the risk of perinatal outcomes even in physiological pregnancy and labor, especially in the intrapartum period, and can lead to the development of complications in the woman in childbirth and newborn [8, 12, 31].

According to official statistics, up to 20% of pregnant women belong to the group of high perinatal risk. These women are indicated for medical care in perinatal centers and obstetric hospitals of the third level. Women with low and moderate perinatal risk are referred for delivery to obstetric hospitals of the first and second levels. According to the authors, increasing the availability of timely diagnostics (laboratory, instrumental and ultrasound), strengthening the material and technical base of district obstetric medical organizations is a reserve for reducing the perinatal mortality rate [21, 35].

Studies by large number of authors have confirmed that correct routing to obstetric hospitals at the appropriate level improves outcomes and reduces reproductive losses among pregnant women with high risks [56].

However, there are cases of irrational routing of this contingent of patients due to insufficient functional coordination or lack of special transport, which hinders timely transportation of a woman or newborn [23].

The increase in the newborn mortality (for them who up to 7 days of life) in urban obstetric facilities and, especially, in tertiary health care facilities, as well as its decrease in rural health care organizations is a natural result of proper routing of pregnant women and high-risk women in labor and delivery [8].

The main role in the structure of organizations providing obstetric-gynecological and neonatal care is played by third-level obstetric organizations. Perinatal centers are located at this level, to which high-risk pregnant women and their children are mainly referred. These centers are provided with highly qualified staff and modern equipment. The establishment of perinatal centers began according to Order No. 881 of the Ministry of Healthcare of the USSR in 1989 [32].

Provision of emergency and urgent care to newborns has a constant development and improvement [46]. It should be noted that, in addition to neonatal intensive care units, a city has large number of pediatric hospitals with beds for premature newborns and preterm infants with pathology [24].

One of the important problems not only in Russia, but also in all countries of the world, is the problem of medical evacuation of newborns. Improving the transportation of infants in need of emergency and urgent medical care will have a positive impact on both the quality of perinatal care and the reduction of neonatal losses. If it is necessary to transfer a newborn requiring treatment (nursing) to higher-level medical organizations, obstetric hospital physicians should provide the necessary therapeutic care until the neonatal resuscitation team arrives [35]. This is argued by the fact that the child (under the pretext of non-transportability) may not be transferred to another medical organization to provide more highly qualified care [38]. Early transfer to medical organizations with a higher level of diagnosis and treatment is the most effective point of treatment and evacuation tactics of emergency neonatology [23].

Another extremely important problem of our health care is its staffing. It is noted that the availability of physicians in the Russian Federation is very uneven. The share of neonatologists in the country is just over 60% [9].

There is a deficiency of neonatologists in almost all regions of Russia. Many authors note that the share of senior citizens among doctors is high and share of young specialists is low. In addition, there is a low retention rate of young specialists in the field [36, 41]. One of the qualitative characteristics of the availability of medical workers is the level of their qualification. 34.4% of doctors have the highest category, first category — 21.5%, second category — 7.3%. 1/3 of doctors has no qualification category at all [30]. A negative aspect of staffing is the low level of provision of our health care with middle medical staff [26].

Thus, the domestic system of maternal and child health care has undergone a number of significant changes in recent decades. Based on the positive experience of obstetric and neonatal medical care in developed countries, the obstetrics service was modernized. This improvement has had a positive impact on the reduction of perinatal mortality and neonatal morbidity. However, the system of organization of medical care for pregnant women, women in childbirth and newborns in Russia has a number of peculiarities, which are primarily due to the specific features of the regions. The main problems in organization of medical care for newborns include different levels of economic development, accessibility of medical care and staffing of neonatology services of obstetrics organizations of the Russian Federation, as well as violations of the routing of pregnant women, women in childbirth and delivery, puerperas and newborns.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

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EXHIBITION "LENINGRAD PEDIATRIC MEDICAL INSTITUTE IN THE HARSH YEARS OF THE BLOCKADE" IN THE PRESIDENTIAL LIBRARY OF ST. PETERSBURG

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ВЫСТАВКА «ЛЕНИНГРАДСКИЙ ПЕДИАТРИЧЕСКИЙ МЕДИЦИНСКИЙ ИНСТИТУТ В СУРОВЫЕ ГОДЫ БЛОКАДЫ» В ПРЕЗИДЕНТСКОЙ БИБЛИОТЕКЕ САНКТ-ПЕТЕРБУРГА

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On January 18, 2023, St. Petersburg celebrated one of the most significant days in its history — the day when in 1943 The Siege of Leningrad was ended. The defense of Leningrad is forever inscribed in the history of Russia as an incredibly tragic and at the same time heroic event.

For 872 days, from September 8, 1941, The Siege of Leningrad lasted, which according to official data took the lives of more than 630 000 of its inhabitants, although, according to historians' calculations, this number may reach 800 000.

The ring of the enemy siege was finished as the result of the success of the Red Army's

Operation “Spark” (Iskra). It was planned since 1942 and began on January 12, 1943, the fighting was led by Marshals Georgy Zhukov and Kliment Voroshilov. Land-forces of the Leningrad and Volkhov Fronts, supported by the Baltic Fleet aviation, decisively attacked the German army on the Shlisselburg-Sinyavinsky salient.

And on January 18 as the result of the Soviet offensive the city of Shlisselburg was liberated. A gap was formed in the siege ring, as a result of which land communications with Leningrad were restored.

It became possible to resume the supply of food and other necessities to the city. The situation of the inhabitants gradually improved. In fact, it was not so much a military as a humanitarian operation that saved hundreds of thousands of lives, who, probably, couldn’t hardly survive the second blockade winter.

However, the siege was still going on, a bombing and shelling of the city did not stop, people were still suffering and dying from severe malnutrition, avitaminosis and its complications. The siege ring was completely lifted only on January 27, 1944.

But the event of January 18 was extremely important, it was regarded as a psychological and moral victory, it gave people who lived in Leningrad joy and confidence in the inevitable victory over the enemy.

Together with all residents of the city, the staff of the Leningrad Pediatric Medical Institute (LPMI, now St. Petersburg State Pediatric Medical University) endured the years of blockade.

All the days and years of the war and siege our institute worked and fulfilled its tasks: to help the front, to train doctors, to treat and to save the lives of children and mothers, to conduct scientific and organizational work.

That is why for us, the university staff, the memorable dates related to the Great Patriotic War and The Siege of Leningrad are the most tragic, the most reverent and the most memorable.

On the eve of the 80th anniversary of the breakthrough of The Siege of Leningrad, we turned once again to the theme of the Great Patriotic War. For this date the Presidential Library opened the exhibition “Leningrad Pediatric Medical Institute in the severe years of the blockade”, prepared by the staff of the Presidential Library and the Museum of the History of St. Petersburg State Pediatric Medical University under the guidance of the Museum Director I.A. Savina; the design project was made by M.N. Netrebko. This exposition became the second joint exhibition project of SPbSPMU and Presidential Library, realized within the framework of the cooperation agreement between the institutions signed in 2022. The first project was presented in April 2022, when the Presidential Library opened the exposition “LPMI during the siege. Saving Children: Honor and Bravery of Leningrad Pediatricians”, also prepared by the staff of the Museum of the History of St. Petersburg State Pediatric Medical University.

The exhibition “Leningrad Pediatric Medical Institute in the severe years of the blockade” was inaugurated on January 18, 2023.

Yu.S. Nosov, General Director of the Presidential Library, spoke at the opening of the exhibition (Fig. 1). He expressed his hope that the exhibition will resonate with everyone who will see it, with representatives of different generations. He also noted the successful joint work with our university on preserving the memory of the war and the siege and suggested to continue this direction of activity.

Prof. D.O. Ivanov, Rector of the Pediatric University, addressed the audience with a welcoming speech (Fig. 2). He emphasized the uniqueness of LPMI, which carried out multifaceted work to save children in the harshest

Fig. 1. General Director of the Presidential Library Yu.S. Nosov

Рис. 1. Генеральный директор Президентской библиотеки Ю.С. Носов

conditions of the siege. The education of doctors was of great importance: during the war years there were 7 graduations (scheduled and early), about 1000 doctors were trained. He especially noted the dedication of the Institute's staff: "When you see on archive photos how children were helped in these conditions, how in unheated classrooms teachers made classes, students continued to learn medicine, you bow down to these people". He also recalled that very quickly the issue of evacuation of children arose, which was carried out with the participation of doctors of our university. More than 400 000 children remained in Leningrad, their rescue from hunger and disease, preservation of their lives became the most important task of LPMI staff headed by the chief pediatrician of the city A.F. Tur. He emphasized the importance of patriotic education of students on the example of the heroic feat of LPMI staff during the war and the siege of Leningrad.

Fig. 2. Rector of SPbSPMU Professor D.O. Ivanov

Рис. 2. Ректор СПбГПМУ профессор Д.О. Иванов

Chairman of the St. Petersburg Archives Committee P.E. Tishchenko in his welcoming speech noted the documentary base of the materials presented at the exhibition (Fig. 3). He shared the memories of his relatives, his grandmother, who worked at the enterprises of the city and survived the siege. "Everyone tried to make their part, their contribution to the common Victory, — emphasized P.E. Tishchenko. — Teachers taught, doctors treated, everyone tried to do their best". He noted what a great importance for the defenders of the city was the restoration of street-car traffic. In conclusion, he expressed

Fig. 3. Chairman of the Archival Committee of St. Petersburg P.E. Tishchenko

Рис. 3. Председатель архивного комитета Санкт-Петербурга П.Е. Тищенко

Fig. 4. Director of the Archive of Historical and Political Documents of St. Petersburg V.V. Taradin

Рис. 4. Директор Архива историко-политических документов Санкт-Петербурга В.В. Тарадин

his willingness to continue cooperation with the Pediatric University. The director of the Archive of Historical and Political Documents of St. Petersburg, V.V. Taradin also confirmed this intention (Fig. 4).

Professor G.L. Mikirtichan, the Head of the Department of Humanitarian Disciplines and Bioethics of St. Petersburg State Medical University, emphasized that the main goals of the LPMI staff have always been to take care of mothers and children, to save children's lives, but when we talk about it, we should always take into account the efforts that were made to save them in those incredibly difficult conditions. She recalled that on German maps, the LPMI was listed as "Object No. 708" to be destroyed. The territory was shelled, some days 8–12 times a day, children had to be taken down to bomb shelters. There were no children on the territory of the Institute injured from shelling. Children suffering from severe malnutrition, rickets and other severe diseases spent the hardest winter of 1941–1942 in bomb shelters. And especially great role in the rescue of children played a qualified approach to the organization of nutrition and treatment. All this testifies to the high professionalism of the LPMI staff, their well-coordinated work, selfless devotion to their work.

Further, the director of the Museum of the History of SPbSPMU I.A. Savina conducted a tour of the exhibition, which occupied 24 posters placed on eight digital screens (Fig. 5). The posters presented wartime photographic documents stored in the SPbSPMU Museum's holdings and explanatory text. Each poster or group of posters reflected different aspects of LPMI activity during the years of the war: reorganization of the educational process, treatment and nursing of children, scientific research, activities on children's nutrition, preservation of children's, students' and staff's lives, etc.

A distinctive feature of this exhibition was the involvement of materials from the fund of the Central State Archive of Historical and Political Documents of St. Petersburg. These newfound evidences of the feat of the Pediatric Institute staff in those harsh years were first introduced into the scientific turnover and included in the present exposition. The search for these documents was also carried out by the museum staff with support of Prof. D.O. Ivanov, Rector of St. Petersburg State Pediatric Medical University, P.E. Tishchenko, Chairman of the Archives Committee, and V.V. Taradin, Director of the Archives of Historical and Political Documents of St. Petersburg.

I.A. Savina noted that all time of the war the Institute was headed by Prof. Yu.A. Mendeleva, a Bolshevik with pre-revolutionary experience, a major manager of maternal and infant health care. Thanks to her authority in the government and professional environment were created the necessary conditions for the implementation of all areas of activities of the LPMI staff. The administration of the Institute, party and Komsomol organizations used all available resources to maintain the morale of employees and faith in victory. On the initiative of Yu.A. Mendeleva the institute went to extreme measures — the majority of students were accommodated on the territory of the institute. For this purpose, the warmest rooms of the clinic, which were not damaged by artillery shelling, were re-equipped. Many employees were also accommodated in the departments of the institute. A medical nutrition point was organized, where students and staff received three meals a day,

Fig. 5. Director of the Museum of the History of SPbSPMU I.A. Savina

Рис. 5. Директор музея «Истории СПбГПМУ» И.А. Савина

Fig. 6. Tatiana Vitalievna Fomina

Рис. 6. Татьяна Витальевна Фомина

including vegetables from the Institute's subsidiary farm, as well as medical care, and the weakest staff were accommodated in a specially equipped hospital. Thanks to these measures it was possible to avoid heavy losses from hunger. By the spring of 1942, Yu.A. Mendeleva achieved the first (the best one) category of rations for students to restore their strength after the severe war winter.

In 1943, after the breakthrough of the siege of Leningrad, hospital nutrition standards were slightly increased, and the Institute was able to prepare a full menu for children of all ages staying in the Institute's clinics. An invaluable help in the organization of children's meals was the LPMI's subsidiary farm, created in the pre-war period. Vegetables and fruits were prepared in raw, dried and canned form.

All years of the war, scientific work did not stop, meetings of the Academic Council were held, articles were published, and dissertations were defended. The subjects of scientific research work were changed in relation to the tasks and conditions of the front-line city. The main topics were alimentary dystrophies and

Fig. 7. Rector D.O. Ivanov and T.V. Fomina

Рис. 7. Ректор Д.О. Иванов и Т.В. Фомина

avitaminosis, wartime traumatism, children's infectious diseases, the influence of the blockade on the female organism and fertility functions, etc. In 1943 the question of restoration of the Institute's destroyed economy, its buildings and territory arose. Staff and students took an active part in the restoration work, and mothers caring for their children were also involved.

Experienced pediatricians A.F. Tur, A.B. Volovik, E.I. Fridman, V.N. Ofitserov, G.A. Nikolaev, N.N. Keller, N.E. Surin, N.E. Berg and many others played a great role in the organization of care for children, their treatment and nutrition, nursing of newborns and premature babies, introduction of new approaches to the daily regimen, maintenance of physical and psychomotor development of children.

Almost the entire war in the clinic spent children of front-line soldiers and orphans. For them the Institute became their own home.

For two years, from June 1942 to June 1944, Tanya Fomina was treated in the hospital clinic for severe malnutrition and dyspepsia. She was born in Leningrad in May 1942. Last year she celebrated her 80th birthday and was invited to the opening of the exhibition as a witness of those years. In her speech, she expressed her gratitude to the doctors who took her out and kept her alive. She dedicated a poem to this event, which she recited in the final part of her story (Fig. 6).

In the exposition of the museum "History of St. Petersburg State Pediatric Medical University" she found not only a photo of her attending physician, but also a picture taken in 1944, where she was among a group of children, already quite well-fed. In gratitude for the saved life Tatyana Vitalievna brought digitized photos of her family, poems dedicated to the months of treatment, and her first and most favorite toy to our museum.

All those present warmly welcomed T.V. Fomina, and the Rector presented her with a memorable gift (Fig. 7).

The exhibition demonstrated the heroic activities of the entire LPMI staff headed by Director Yu.A. Mendeleva and Chief Physician D.S. Tumarkin during the blockade. For all people who lived in Lenungrad the day of January 18, 1943 became a significant date in the life of the city exhausted by the siege. According to the memories of the head of the Department of

Fig. 8. At the opening of the exhibition. Rector D.O. Ivanov, Vice-rectors V.I. Orel, E.N. Berezkina, I.D. Lyakhov

Рис. 8. На открытии выставки. Ректор Д.О. Иванов, проректоры В.И. Орел, Е.Н. Березкина, И.Д. Ляхов

Fig. 9. Museum staff M.N. Netrebko, T.V. Karpova, I.A. Savina, V.I. Vetrov with the scientific Head of the museum G.L. Mikirtichan

Рис. 9. Сотрудники музея М.Н. Нетребко, Т.В. Карпова, И.А. Савина, В.И. Ветрова с научным руководителем музея Г.Л. Микиртичан

Propaedeutics of Childhood Diseases A.B. Volovik, since that time "communication with the big land was restored, delivery of all necessary things improved, there were fewer children with severe malnutrition and avitaminosis and condition of pregnant women and their lactation improved".

The opening of the exhibition was attended by representatives of the administration of SPbSPMU, staff of the Department of External Relations and Information Policy, the museum "History of SPbSPMU", faculty and students of the University (Fig. 8, 9).

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

ПРАВИЛА ДЛЯ АВТОРОВ

Утв. приказом и.о. ректора
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При представлении рукописи в Журнал Авторы несут ответственность за раскрытие своих финансовых и других конфликтных интересов, способных оказать влияние на их работу. В рукописи должны быть упомянуты все лица и организации, оказавшие финансовую поддержку (в виде грантов, оборудования, лекарств или всего этого вместе), а также другое финансовое или личное участие.

АВТОРСКОЕ ПРАВО

Редакция отбирает, готовит к публикации и публикует переданные Авторами материалы. Авторское право на конкретную статью принадлежит авторам статьи. Авторский гонорар за публикации статей в Журнале не выплачивается. Автор передает, а Редакция принимает авторские материалы на следующих условиях:

1) Редакции передается право на оформление, издание, передачу Журнала с опубликованным материалом Автора для целей реферирования статей из него в Реферативном журнале ВИНИТИ, РНИЦ и базах данных, распространение Журнала/авторских материалов в печатных и электронных изданиях, включая размещение на выбранных либо созданных Редакцией сайтах в сети Интернет в целях доступа к публикации в интерактивном режиме любого заинтересованного лица из любого места и в любое время, а также на распространение Журнала с опубликованным материалом Автора по подписке;
2) территория, на которой разрешается использовать авторский материал, — Российская Федерация и сеть Интернет;
3) срок действия Договора — 5 лет. По истечении указанного срока Редакция оставляет за собой, а Автор подтверждает бессрочное право Редакции на продолжение размещения авторского материала в сети Интернет;
4) Редакция вправе по своему усмотрению без каких-либо согласований с Автором заключать договоры и соглашения с третьими лицами, направленные на дополнительные меры по защите авторских и издательских прав;
5) Автор гарантирует, что использование Редакцией предоставленного им по настоящему Договору авторского материала не нарушит прав третьих лиц;
6) Автор оставляет за собой право использовать предоставленный по настоящему Договору авторский материал самостоятельно, передавать права на него по договору третьим лицам, если это не противоречит настоящему Договору;
7) Редакция предоставляет Автору возможность безвозмездного получения справки с электронными адресами его официальной публикации в сети Интернет;
8) при перепечатке статьи или ее части ссылка на первую публикацию в Журнале обязательна.

ПОРЯДОК ЗАКЛЮЧЕНИЯ ДОГОВОРА И ИЗМЕНЕНИЯ ЕГО УСЛОВИЙ

Заключением Договора со стороны Редакции является опубликование рукописи данного Автора в журнале «Medicine and health care organization / Медицина и организация здравоохранения» и размещение его текста в сети Интернет. Заключением Договора со стороны Автора, т. е. полным и безоговорочным принятием Автором условий Договора, является передача Автором рукописи и экспертного заключения.

ОФОРМЛЕНИЕ РУКОПИСИ

Редакция журнала приветствует полностью двуязычные статьи.

Статья должна иметь (НА РУССКОМ И АНГЛИЙСКОМ ЯЗЫКАХ):

1. Заглавие (Title). Должно быть кратким (не более 120 знаков), точно отражающим содержание статьи.
2. Сведения об авторах (публикуются). Для каждого автора указываются: фамилия, имя и отчество, место работы, почтовый адрес места работы, e-mail, ORCID. Фамилии авторов рекомендуется транслитерировать так же, как в предыдущих публикациях или по системе BGN (Board of Geographic Names), см. сайт http://www.translit.ru.
3. Резюме (Summary) (1500–2000 знаков, или 200–250 слов) помещают перед текстом статьи. Резюме не требуется при публикации рецензий, отчетов о конференциях, информационных писем.

Авторское резюме к статье является основным источником информации в отечественных и зарубежных информационных системах и базах данных, индексирующих журнал. Резюме доступно на сайте журнала «Medicine and health care organization / Медицина и организация

здравоохранения» и индексируется сетевыми поисковыми системами. Из аннотации должна быть понятна суть исследования, нужно ли обращаться к полному тексту статьи для получения более подробной, интересующей его информации. Резюме должно излагать только существенные факты работы.

Рекомендуемая структура аннотации: введение (Background), цели и задачи (Purposes and tasks), методы (Materials and methods), результаты (Results), выводы (Conclusion). Предмет, тему, цель работы нужно указывать, если они не ясны из заглавия статьи; метод или методологию проведения работы целесообразно описывать, если они отличаются новизной или представляют интерес с точки зрения данной работы. Объем текста авторского резюме определяется содержанием публикации (объемом сведений, их научной ценностью и/или практическим значением) и должен быть в пределах 200–250 слов (1500–2000 знаков).

4. Ключевые слова (Key words) — от 3 до 10 ключевых слов или словосочетаний, которые будут способствовать правильному перекрестному индексированию статьи, помещаются под резюме с подзаголовком «ключевые слова». Используйте термины из списка медицинских предметных заголовков (Medical Subject Headings), приведенного в Index Medicus (если в этом списке еще отсутствуют подходящие обозначения для недавно введенных терминов, подберите наиболее близкие из имеющихся). Ключевые слова разделяются точкой с запятой.
5. Заголовки таблиц, подписи к рисункам, а также все тексты на рисунках и в таблицах должны быть на русском и английском языках.
6. Литература (References). Список литературы должен представлять полное библиографическое описание цитируемых работ в соответствии с NLM (National Library of Medicine) Author A. A., Author B. B., Author C. C. Title of article. Title of Journal. 2005;10(2):49–53. Фамилии и инициалы авторов в пристатейном списке приводятся в алфавитном порядке, сначала русского, затем латинского алфавита. В описании указываются ВСЕ авторы публикации. Библиографические ссылки в тексте статьи даются цифрой в квадратных скобках. Ссылки на неопубликованные работы не допускаются.

Книга: Автор(ы) название книги (знак точка) место издания (двоеточие) название издательства (знак точка с запятой) год издания.

Если в качестве автора книги выступает редактор, то после фамилии следует ред.

Преображенский Б. С., Тёмкин Я. С., Лихачёв А. Г. Болезни уха, горла и носа. М.: Медицина; 1968.

Радзинский В. Е., ред. Перинеология: учебное пособие. М.: РУДН; 2008.

Brandenburg J. H., Ponti G. S., Worring A. F. eds. Vocal cord injection with autogenous fat. 3rd ed. NY: Mosby; 1998.

Глава из книги: Автор (ы) название главы (знак точка) В кн.: или In: далее описание книги [Автор (ы) название книги (знак точка) место издания (двоеточие) название издательства (знак точка с запятой) год издания] (двоеточие) стр. от и до.

Коробков Г. А. Темп речи. В кн.: Современные проблемы физиологии и патологии речи: сб. тр. Т. 23. М.; 1989: 107–11.

Статья из журнала

Автор (ы) название статьи (знак точка) название журнала (знак точка) год издания (знак точка с запятой) том (если есть в круглых скобках номер журнала) затем знак (двоеточие) страницы от и до.

Кирющенков А. П., Совчи М. Г., Иванова П. С. Поликистозные яичники. Акушерство и гинекология. 1994; N 1: 11–4.

Brandenburg J. H., Ponti G. S., Worring A. F. Vocal cord injection with autogenous fat: a long-term magnetic resona. Laryngoscope. 1996; l06 (2, pt l): 174–80.

Тезисы докладов, материалы научных конф.

Бабий А. И., Левашов М. М. Новый алгоритм нахождения кульминации экспериментального нистагма (миниметрия). III съезд оториноларингологов Респ. Беларусь: тез. докл. Минск; 1992: 68–70.

Салов И. А., Маринушкин Д. Н. Акушерская тактика при внутриутробной гибели плода. В кн.: Материалы IV Российского форума «Мать и дитя». М.; 2000; ч. 1: 516–9.

Авторефераты

Петров С. М. Время реакции и слуховая адаптация в норме и при периферических поражениях слуха. Автореф. дис… канд. мед. наук. СПб.; 1993.

Описание интернет-ресурса

Щеглов И. Насколько велика роль микрофлоры в биологии вида-хозяина? Живые системы: научный электронный журнал. Доступен по: http://www.biorf.ru/catalog.aspx?cat_id=396&d_no=3576 (дата обращения 02.07.2012).

Kealy M. A., Small R. E., Liamputtong P. Recovery after caesarean birth: a qualitative study of women's accounts in Victoria, Australia. BMC Pregnancy and Childbirth. 2010. Available at: http://www.biomedcentral.com/1471–2393/10/47/. (accessed 11.09.2013).

Для всех статей, имеющих DOI, индекс необходимо указывать в конце библиографического описания.

По новым правилам, учитывающим требования международных систем цитирования, библиографические списки (References) входят в англоязычный блок статьи и, соответственно, должны даваться не только на языке оригинала, но и в латинице (романским алфавитом). Поэтому авторы статей должны давать список литературы в двух вариантах: один на языке оригинала (русскоязычные источники кириллицей, англоязычные латиницей), как было принято ранее, и отдельным блоком тот же список литературы (References) в романском алфавите для Scopus и других международных баз данных, повторяя в нем все источники литературы, независимо от того, имеются ли среди них иностранные. Если в списке есть ссылки на иностранные публикации, они полностью повторяются в списке, готовящемся в романском алфавите.

В романском алфавите для русскоязычных источников требуется следующая структура библиографической ссылки: автор(ы) (транслитерация), перевод названия книги или статьи на английский язык, название источника (транслитерация), выходные данные в цифровом формате, указание на язык статьи в скобках (in Russian).

Технология подготовки ссылок с использованием системы автоматической транслитерации и переводчика.

На сайте http://www.translit.ru можно бесплатно воспользоваться программой транслитерации русского текста в латиницу. Программа очень простая.

1. Входим в программу Translit.ru. В окошке «варианты» выбираем систему транслитерации BGN (Board of Geographic Names). Вставляем в специальное поле весь текст библиографии на русском языке и нажимаем кнопку «в транслит».
2. Копируем транслитерированный текст в готовящийся список References.
3. Переводим с помощью автоматического переводчика название книги, статьи, постановления и т.д. на английский язык, переносим его в готовящийся список. Перевод, безусловно, требует редактирования, поэтому данную часть необходимо готовить человеку, понимающему английский язык.
4. Объединяем описания в соответствии с принятыми правилами и редактируем список.
5. В конце ссылки в круглых скобках указывается (in Russian). Ссылка готова.

Примеры транслитерации русскоязычных источников литературы для англоязычного блока статьи

Книга: Avtor (y) Nazvanie knigi (znak tochka) [The title of the book in english] (znak tochka) Mesto izdaniya (dvoetochie) Nazvanie izdatel'stva (znak tochka s zapyatoy) god izdaniya.

Preobrazhenskiy B. S., Temkin Ya. S., Likhachev A. G. Bolezni ukha, gorla i nosa. [Diseases of the ear, nose and throat]. M.: Meditsina; 1968. (in Russian).

Radzinskiy V. E., ed. Perioneologiya: uchebnoe posobie. [Perineology tutorial]. M.: RUDN; 2008. (in Russian).

Глава из книги: Avtor (y) Nazvanie glavy (znak tochka) [The title of the article in english] (znak tochka) In: Avtor (y) Nazvanie knigi (znak tochka) Mesto izdaniya (dvoetochie) Nazvanie izdatel'stva (znak tochka s zapyatoy) god izdaniya]. (dvoetochie) stranisi ot i do.

Korobkov G. A. Temp rechi. [Rate of speech]. In.: Sovremennye problemy fiziologii i patologii rechi: sb. tr. T. 23. M.; 1989: 107–11. (in Russian).

Статья из журнала: Avtor (y) Nazvanie stat'I (znak tochka) [The title of the article in english] (znak tochka) Nazvanie zhurnala (znak tochka) god izdaniya (znak tochka s zapyatoy) tom (esli est' v kruglykh skobkakh nomer zhurnala) zatem (znak dvoetochie) stranitsy ot i do.

Kiryushchenkov A. P., Sovchi M. G., Ivanova P. S. Polikistoznye yaichniki. [Polycystic ovary]. Akusherstvo i ginekologiya. 1994; N 1: 11–4. (in Russian).

Тезисы докладов, материалы научных конф.

Babiy A. I., Levashov M. M. Novyy algoritm nakhozhdeniya kul'minatsii eksperimental'nogo nistagma (minimetriya). [New algorithm of finding of the culmination experimental nystagmus (minimetriya)]. III s'ezd otorinolaringologov Resp. Belarus': tez. dokl. Minsk; 1992: 68–70. (in Russian).

Salov I. A., Marinushkin D. N. Akusherskaya taktika pri vnutriutrobnoy gibeli ploda. [Obstetric tactics in intrauterine fetal death]. In: Materialy IV Rossiyskogo foruma «Mat' i ditya». M.; 2000; ch.1:516–9. (in Russian).

Авторефераты

Petrov S. M. Vremya reaktsii i slukhovaya adaptatsiya v norme i pri perifericheskikh porazheniyakh slukha. [Time of reaction and acoustical adaptation in norm and at peripheral defeats of hearing]. PhD thesis. SPb.; 1993. (in Russian).

Описание интернет-ресурса

Shcheglov I. Naskol'ko velika rol' mikroflory v biologii vida-khozyaina? [How great is the microflora role in type-owner biology?]. Zhivye sistemy: nauchnyy elektronnyy zhurnal. Available at: http://www.biorf.ru/catalog.aspx?cat_id=396&d_no=3576 (accessed 02.07.2012). (in Russian).

ОТВЕТСТВЕННОСТЬ ЗА ПРАВИЛЬНОСТЬ БИБЛИОГРАФИЧЕСКИХ ДАННЫХ НЕСЕТ АВТОР.

Остальные материалы предоставляются либо на русском, либо на английском языке, либо на обоих языках по желанию.

Структура основного текста статьи.

Введение, изложение основного материала, заключение, литература. Для оригинальных исследований — введение, методика, результаты исследования, обсуждение результатов, литература.

В разделе «методика» обязательно указываются сведения о статистической обработке экспериментального или клинического материала. Единицы измерения даются в соответствии с Международной системой единиц — СИ. Фамилии иностранных авторов, цитируемые в тексте рукописи, приводятся в оригинальной транскрипции.

В конце каждой статьи обязательно указываются вклад авторов в написание статьи, источники финансирования (если имеются), отсутствие конфликта интересов, наличие согласия на публикацию со стороны пациентов.

Объем рукописей.

Объем рукописи обзора не должен превышать 25 стр. машинописного текста через два интервала, 12 кеглем (включая таблицы, список литературы, подписи к рисункам и резюме на английском языке), поля не менее 25 мм. Нумеруйте страницы последовательно, начиная с титульной. Объем рукописи статьи экспериментального характера не должен превышать 15 стр. машинописного текста; кратких сообщений (писем в редакцию) — 7 стр.; отчетов о конференциях — 3 стр.; рецензий на книги — 3 стр. Используйте колонтитул — сокращенный заголовок и нумерацию страниц, для помещения вверху или внизу всех страниц статьи.

Иллюстрации и таблицы. Число рисунков рекомендуется не более 5. В подписях под рисунками должны быть сделаны объяснения значений всех кривых, букв, цифр и прочих условных обозначений. Все графы в таблицах должны иметь заголовки. Повторять одни и те же данные в тексте, на рисунках и в таблицах не следует. Рисунки, схемы, фотографии должны быть представлены в расчете на печать в черно-белом виде или уровнями серого в точечных форматах tif, bmp (300–600 dpi), или в векторных форматах pdf, ai, eps, cdr. При оформлении графических материалов учитывайте размеры печатного поля Журнала (ширина иллюстрации в одну колонку — 90 мм, в 2 — 180 мм). Масштаб 1:1.

РЕЦЕНЗИРОВАНИЕ

Статьи, поступившие в редакцию, обязательно рецензируются. Если у рецензента возникают вопросы, то статья с комментариями рецензента возвращается Автору. Датой поступления статьи считается дата получения Редакцией окончательного варианта статьи. Редакция оставляет за собой право внесения редакторских изменений в текст, не искажающих смысла статьи (литературная и технологическая правка).

АВТОРСКИЕ ЭКЗЕМПЛЯРЫ ЖУРНАЛА

Редакция обязуется выдать Автору 1 экземпляр Журнала на каждую опубликованную статью вне зависимости от числа авторов. Авторы, проживающие в Санкт-Петербурге, получают авторский экземпляр Журнала непосредственно в Редакции. Иногородним Авторам авторский экземпляр Журнала высылается на адрес автора по запросу от автора. Экземпляры спецвыпусков не отправляются авторам.

АДРЕС РЕДАКЦИИ

194100, Санкт-Петербург, Литовская ул., 2
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Сайт журнала: http://www.gpmu.org/science/pediatrics-magazine/Medicine_organization.