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IMPORTANCE OF THE QUALITY OF DISPENSARY OBSERVATION DURING PREGNANCY FOR REDUCING INFANT MORTALITY

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ABSTRACT. In the Chechen Republic, which has high infant mortality rates, the average rate of decline in indicators over the past five years is fixed 13.3%. In order to assess the impact of dispensary observation of pregnant women in antenatal clinics on the level of infant mortality in the republic, the analysis of official statistics data and information obtained by copying from Form No. 32 "Information on medical care for pregnant women, women in labor and postpartum" for 2018–2022 was carried out. It was established that during the study period in antenatal clinics of the Chechen Republic an increase in early coverage of pregnant women with dispensary observation by 15.6%, examinations by a therapist before 12 weeks of pregnancy — by 13.2%, ultrasound procedure made — by 26.0% and biochemical screening — by 21.0% was achieved, which made it possible by 2022 to improve the level of these indicators to exceed the Russian average values. In the Chechen Republic, the frequency of detection of pre-existing hypertension complicating pregnancy and childbirth (5.2 times), diseases of the circulatory system (2.2 times), venous complications (1.6 times), diabetes mellitus (28.9 times), urinary tract infections (3.7 times) and placenta previa, including bleeding (1.7 times) is lower than the average in Russia. At the same time, the region has a higher incidence of preeclampsia (moderate and severe) and anemia (2.4 times), eclampsia during pregnancy (1.3 times) and premature placental abruption (1.4 times). In the republic, with an improvement in the detection of hypertension by 2.5 times (from 3.60 to 9.00‰), preeclampsia by 1.8 times (from 55.02 to 101.42‰) and anemia by 1.8 times (from 365.42 to 649.81‰) the frequency of eclampsia decreased by 1.4 times (from 0.24 to 0.17‰) and venous complications by 2.3 times (from 33.30‰ to 14.80‰). In addition, over five years in the region, the incidence of placenta previa has increased 1.8 times (from 2.59 to 4.56‰), cases of diabetes mellitus has increased 3.0 times (from 2.59 to 4.56‰) and 2.5 times — cases of urinary tract infections (from 6.20 to 15.30‰). In the Chechen Republic, where there is a lower proportion of children born with a body weight of up to 2500 grams (1.5 times) and a high proportion of normal births (1.4 times), 1.7 times less likely to detect congenital malformations

in the fetus and 3.9 times less in women with pregnancy abnormalities. Thus, improvement of the quality of clinical observation of pregnant women in antenatal clinics of the Chechen Republic had a significant impact on reducing the infant mortality rate in the region.

KEY WORDS: infant mortality; prematurity; antenatal clinics; Chechen Republic; clinical observation during pregnancy; morbidity in pregnant women; proportion of normal births.

РОЛЬ КАЧЕСТВА ДИСПАНСЕРНОГО НАБЛЮДЕНИЯ В ПЕРИОД БЕРЕМЕННОСТИ В СНИЖЕНИИ МЛАДЕНЧЕСКОЙ СМЕРТНОСТИ

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РЕЗЮМЕ. В Чеченской Республике, имеющей высокие значения младенческой смертности, темпы снижения показателей в среднем за последние пять лет составили 13,3%. С целью оценки влияния диспансерного наблюдения беременных в женских консультациях на младенческую смертность в республике был проведен анализ данных официальной статистики и сведений, полученных путем выкопировки из Формы № 32 «Сведения о медицинской помощи беременным, роженицам и родильницам» за 2018–2022 гг. Установлено, что за исследуемый период в женских консультациях Чеченской Республики имел место рост раннего охвата беременных диспансерным наблюдением на 15,6%, осмотрами терапевтом до 12 недель беременности — на 13,2%, УЗИ — на 26,0% и биохимическим скринингом — на 21,0%, что позволило к 2022 г. повысить уровень данных показателей до превышающих среднероссийские значения. В Чеченской Республике была ниже, чем в среднем в России, частота выявляемости существовавшей ранее гипертензии, осложняющей беременность и роды (в 5,2 раза), болезней системы кровообращения (в 2,2 раз), венозных осложнений (в 1,6 раза), сахарного диабета (в 28,9 раза), инфекций мочеполовых путей (в 3,7 раза) и предлежания плаценты, в том числе с кровотечением (в 1,7 раза). В то же время в регионе выше частота преэклампсии (средней тяжести и тяжелой) и анемии (в 2,4 раза), эклампсии во время беременности (в 1,3 раза) и преждевременной отслойки плаценты (в 1,4 раза). В республике с ростом выявляемости гипертензии в 2,5 раза (с 3,60 до 9,00‰), преэклампсии в 1,8 раза (с 55,02 до 101,42‰) и анемии в 1,8 раза (с 365,42 до 649,81‰) снизилась частота эклампсии в 1,4 раза (с 0,24 до 0,17‰) и венозных осложнений в 2,3 раза (с 33,30 до 14,80‰). Кроме того, за пять лет в регионе в 1,8 раза выросла частота предлежания плаценты (с 2,59 до 4,56‰), в 3,0 раза — сахарного диабета (с 2,59 до 4,56‰) и в 2,5 раза — инфекций мочеполовых путей

(с 6,20 до 15,30‰). В Чеченской Республике, где наблюдается более низкий в сравнении со страной, удельный вес детей, родившихся с массой тела до 2500 грамм (в 1,5 раза), и высокий удельный вес нормальных родов (в 1,4 раза), в 1,7 раза реже выявляются врожденные пороки развития у плода и в 3,9 раза — женщины с отклонениями беременности.. Таким образом, повышение качества диспансерного наблюдения беременных в женских консультациях Чеченской Республики оказало существенное влияние на снижение уровня младенческой смертности в регионе.

КЛЮЧЕВЫЕ СЛОВА: младенческая смертность; недоношенность; женские консультации; Чеченская Республика; диспансерное наблюдение в период беременности; заболеваемость беременных; удельный вес нормальных родов.

INTRODUCTION

One of the fundamental principles of national health care is high-priority protection of pregnant women and children. In accordance with the Federal Law of 21.11.2011 No. 323-FZ "On the Fundamentals of Health Protection of Citizens in the Russian Federation", children, regardless of their family and social well-being, are subject to special protection, including care for their health and appropriate legal protection in the field of health care. Thus, children have priority rights in medical care provision [18]. Under current legislation, public authorities are obliged to develop and implement programs aimed at prevention, early detection and treatment of diseases in children and their parents in order to preserve the health of the child population and reduce maternal and infant mortality [7]. Infant mortality is an important demographic indicator. Moreover, it most accurately reflects the level of quality and accessibility of medical care for the pediatric population [4, 6]. The mortality rate of children in the first year of life is influenced by many factors. Diseases and pathological conditions associated with preterm delivery and prematurity occupy a special place among them [1].

In 2012, the improvement of perinatal technologies in Russian healthcare led to a change in the regulatory and legal standards regarding the registration of children born at 22 weeks' gestation and weighing 500 grams or more. Starting from 2013, in accordance with international criteria, medical care for this category of newborns must be provided in full. According to the World Health Organization (WHO), about 15 million children are born prematurely every year (more than 10%) [9]. The incidence of prematurity is 5.0–12.5% of all live births in the most developed countries, while the figure can reach 20.0% in the poorest countries of the world. The incidence of prematurity in Russia in the last ten years is 5.0–6.5% [8].

For many years, prematurity was understood as the birth of a child with low birth weight (less than 2500 grams). Currently, anthropometric parameters and the degree of morphofunctional maturity of neonates are not objective criteria for diagnosing prematurity, since they may not correspond to the gestational age due to impaired intrauterine growth (development). In this regard, preterm labor is one of the most urgent problems of modern obstetrics and perinatology. Although the proportion of births with gestational age less than 32 weeks generally does not exceed 1.5–2.0%, they make a very significant contribution to perinatal and infant mortality [17]. A number of studies [2, 5, 17] confirm the direct impact of short gestational period and low parameters of physical development of newborns on the child's ability to survive. At the same time, such medical and social factors as low attendance of pregnant women at antenatal clinics and their under-examination by the time of delivery make an adverse effect.

According to the Passport of the National Project "Health Care" [15], mortality rate of children in the first year of life should not exceed 4.5 cases per 1,000 live births in our country. Over the last five years, the indicator has decreased to 4.44‰ (Fig. 1). However, such an optimistic dynamic of infant mortality is accompanied by a wide variability of indicators in different subjects of the Russian Federation. The Chechen Republic can be singled out among the regions with high mortality rates among infants in the first year of life, where the rate of decline is one of the highest in Russia (13.3% on average over the last five years).

Significant improvement in the child health care system, which is ensured by joint work of neonatologists and pediatricians, has made a considerable contribution to the reduction of infant

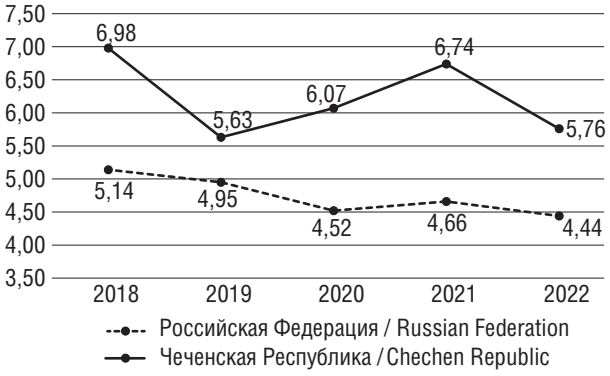

Fig. 1. Dynamics of infant mortality in the Russian Federation and the Chechen Republic in 2018–2022 (in ‰)

Рис. 1. Динамика младенческой смертности в Российской Федерации и Чеченской Республике в 2018–2022 гг. (в ‰)

mortality rates. Nevertheless, obstetric factors play a crucial role in the mortality rate, and the level of preterm delivery and prematurity remains quite high in our country. On this basis, assessment of prenatal care follow-ups provided to pregnant women in antenatal clinics on the regional level and its influence on the infant mortality rate is a relevant topic for research.

AIM

To assess the influence of prenatal care follow-ups of pregnant women in antenatal clinics on the regional infant mortality rate.

MATERIALS AND METHODS

Following data were used as basic materials for the research: Rosstat data [3], statistical materials of the Federal State Budgetary Institution "Russian Research Institute of Health" under the Ministry of Health [10–14] and Form No. 32 "Information on medical care for pregnant women, women in labor and postpartum" (annual, form code according to National Index of Administrative Documentation (NIAD) 0609364) for the Russian Federation and the Chechen Republic for 2018–2022.

Extensive and intensive indicators were calculated and analyzed over five years. Indicator values of 2018 were taken as the baseline. The infant mortality rate was defined as an effective feature. The indicators characterizing the performance of antenatal clinics and morbidity of women complicating the course of childbirth as well as the postpartum period were taken as factorial attributes. The following indicators of the performance of antenatal clinics were examined and analyzed: early coverage of pregnant women with prenatal care follow-ups; the proportion of pregnant women examined by a general practitioner, including up to 12 weeks; and the coverage of pregnant women with screening diagnostic tests (ultrasound and biochemical screening tests). The nonparametric Spearman rank correlation method was used to assess the relationship between the indicators. The statistical significance was assessed using Student's t-criterion. Differences were considered significant at $p < 0.05$. Statistical processing was performed by means of MS Office 2016 and StatSoft STATISTICA 10.0 software packages.

RESULTS AND DISCUSSION

The rate of early coverage of pregnant women with prenatal care follow-ups characterizes the medical activity of women during pregnancy. It is one of the leading indicators of preventive work of the outpatient obstetric service as well. Optimally, the indicator must be close to 100%. An assessment of the early coverage of pregnant women in antenatal clinics in the Chechen Republic revealed that the coverage in the Chechen Republic was significantly lower than the average in the Russian Federation until 2022 ($p < 0.001$) (Fig. 2). In 2022, the proportion of pregnant women registered at antenatal clinics before 12 weeks exceeded the Russian average by 5.9% ($p < 0.001$). It was established that there was a positive trend in early coverage of pregnant women with prenatal care follow-ups in both the Russian Federation and the Chechen Republic in 2018–2022 (+2.3 and +15.6%, respectively; $p < 0.001$).

According to the Order of the Ministry of Health of Russia (MH) from 20.10.2020 No. 1130n "On Approval of the Procedure for the provision of medical care in the specialty «obstetrics and gynecology", examinations of pregnant women are carried out by a general practitioner at least twice during physiological pregnancy (hereinafter Order [16]). The first examination is carried out no later than 7–10 days from the initial visit to an antenatal clinic. The proportion of pregnant women examined by a general practitioner and the proportion of pregnant women examined by a general practitioner before 12 weeks of pregnancy characterize the level of prenatal care follow-ups among

Table 1

Indicators of the proportion of pregnant women examined by a therapist in the Russian Federation and the Chechen Republic in 2018–2022 (per 100 women who completed pregnancy)

Таблица 1

Показатели удельного веса беременных, осмотренных терапевтом, в Российской Федерации и Чеченской Республике в 2018–2022 гг. (на 100 женщин, закончивших беременность)

Показатель / Index	Территория / Territory	Годы / Years					Динамика (% и р) / Dynamics (% and p)
		2018	2019	2020	2021	2022	
Осмотрены терапевтами, всего / Examined by therapists, total	РФ/ RF	97,82	98,03	96,71	96,73	97,84	+0,02; <0,001
	ЧР / CR	96,50	97,40	96,82	97,81	99,33	+2,8; <0,001
Осмотрены терапевтами до 12 недель беременности / Examined by therapists up to 12 weeks of pregnancy	РФ / RF	87,29	88,01	85,51	88,23	89,41	–2,4; <0,001
	ЧР / CR	84,42	83,49	81,69	87,85	97,31	–13,2; <0,001

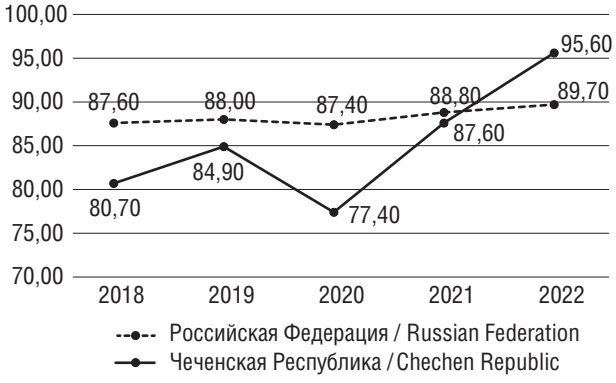

Fig. 2. Dynamics of early coverage of pregnant women with dispensary observation in antenatal clinics of the Russian Federation and the Chechen Republic in 2018–2022 (in %)

Рис. 2. Динамика раннего охвата беременных диспансерным наблюдением в женских консультациях Российской Федерации и Чеченской Республики в 2018–2022 гг. (в %)

pregnant women. The research revealed that the proportion of pregnant women examined by a general practitioner before 12 weeks of pregnancy, along with the early coverage of pregnant women with dispensary care, had been lower in the Chechen Republic until 2022 ($p < 0.05$). Starting from 2022, the indicator exceeded the national average by 7.9% ($p < 0.05$) (Table 1). In 2018, the increase of the indicator amounted to 2.4% in Russia and 13.2% in the Chechen Republic.

There was performed an assessment of specific gravity of pregnant women examined by a general practitioner (in total). It demonstrated that the region's indicator began to exceed the Russian average in 2020, and in 2022 the difference between them amounted to 1.5% ($p < 0.001$). Whereas the indicator remained the same in Russia, it increased by 2.8% in the Chechen Republic compared to the baseline level.

Perinatal care follow-ups include not only check-ups by medical specialists, but also a number of special examinations, among which special attention is paid to screening methods: ultrasound and biochemical screening of serum marker levels. According to the current Order, ultrasound is performed twice: at 11–14 weeks and 19–21 weeks of gestation [16]. The study showed that the coverage of pregnant women with ultrasound in antenatal clinics in the Chechen Republic until 2021 was 73.61–86.94%, which was significantly lower ($p < 0.05$) than in Russia in similar years (90.52–97.72%). Starting from 2021, the number of women covered by screening ultrasound in the Republic increased and in 2022 amounted to 99.52%, which was 6.0% higher than the Russian average ($p < 0.05$). The detection rate of congenital malformations (CM) increases each year in Russia. In 2022 it reached 4.91%. However, taking into account multidirectional dynamics, the Chechen Republic showed a 1.7-fold lower rate by 2022, which amounted to 2.86% ($p < 0.05$ (Table 2).

Assessment of biochemical screening coverage showed that the indicators in the Chechen Republic exceeded the national ones starting from 2020. Average screening test coverage of pregnant women in 2020–2022 amounted to 96.72%, which is 5.81% higher than in the

Table 2

Indicators of coverage of pregnant women with diagnostic tests in the Russian Federation and the Chechen Republic in 2018–2022 (per 100 women who completed pregnancy)

Таблица 2

Показатели охвата беременных диагностическими исследованиями в Российской Федерации и Чеченской Республике в 2018–2022 гг. (на 100 женщин, закончивших беременность)

Показатель / Index	Территория / Territory	Годы / Years					Динамика (% и p) / Dynamics (% and p)
		2018	2019	2020	2021	2022	
Охват УЗИ плода, всего / Fetal ultrasound coverage, total	РФ / RF	96,80	97,72	90,52	91,44	93,50	–3,4; <0,001
	ЧР / CR	73,61	86,11	86,94	94,42	99,52	+26,0; <0,001
из них выявлено плодов с врожденными пороками развития, всего / of these, the of fetuses with congenital malformation identified, total	РФ/ RF	1,50	1,59	3,24	4,22	4,91	+69,5; <0,001
	ЧР / CR	0,87	0,72	4,79	0,44	2,86	+69,6; <0,05
Охват пробами на биохимический скрининг, всего / Sample coverage for biochemical screening, total	РФ/ RF	87,80	88,82	89,83	90,84	92,02	+4,6; <0,001
	ЧР/ CR	75,81	78,12	99,8	95,1	96,0	+21,0; <0,001
из них выявлено женщин с отклонениями / of these, women with disabilities identified	РФ / RF	3,21	3,28	0,90	0,86	0,89	–72,3; <0,001
	ЧР/ CR	0,66	0,81	0,49	0,09	0,30	–54,5; >0,1

country as a whole (90.91%) (p <0.05). Indicator dynamics was analyzed, it revealed that the indicators have increased both in the Russian Federation and in the examined region by 4.6 and 21.0%, respectively, compared to the baseline level. Despite the higher coverage of this type of research, the detection rate of women with abnormalities, both in the country as a whole and in the republic, has decreased almost annually. Moreover, the detection rate in the Republic, compared to the Russian Federation, was on average 3.9 times lower within the five years studied (0.47 per cent versus 1.83 per cent; p <0.05).

Pregnancy morbidity rates are qualitative indicators of antenatal clinics' performance. On the one hand, low rates of morbidity in pregnant women indicate their good health, on the other hand, they may indicate low detection rates of morbidity [19]. Pregnancy morbidity associated with disorders of the circulatory system is a risk factor, and its delayed detection can lead to a negative outcome in labor. The indicators assessed allowed us to establish (Table 3) that the detection rate of pre-existing hypertension complicating pregnancy, labor and postpartum period in the Chechen Republic was on average 5.2 times lower in 2018–2022 than in Russia (p <0.01), circulatory system diseases — 2.2 times lower (p <0.01) and venous complications — 1.6 times lower (p <0.05). Simultaneously, the incidence of pre-eclampsia (moderate to severe) (p <0.01) and anaemia was 2.4 times higher (p <0.01), and eclampsia during pregnancy was 1.3 times higher (p >0.1). At the same time, as the detection of hypertension increased 2.5-fold (from 3.60 to 9.00‰), pre-eclampsia 1.8-fold (from 55.02 to 101.42‰) and anaemia 1.8-fold (from 365.42 to 649.81‰), the incidence of eclampsia decreased 1.4-fold (from 0.24 to 0.17‰) and venous complications 2.3-fold (from 33.30 to 14.80‰).

The following nosological forms of morbidity among pregnant women, including placenta previa and premature detachment, diabetes mellitus and genitourinary tract infections, also significantly differed from the national average. On average over five years, diabetes mellitus was 28.9 times less frequent (p <0.001), genitourinary tract infections 3.7 times less frequent (p <0.001) and placenta previa, including haemorrhage, was 1.7 times less frequent (p >0.1) among pregnant women in the Chechen Republic (Table 4). Such complication as premature placental abruption was 1.4 times more frequent (p >0.1). Analyzing the morbidity dynamics of pregnant women with certain nosological forms in the Chechen

Table 3

Morbidity in pregnant women associated with disorders of the cardiovascular system complicating the course of childbirth in the Russian Federation and the Chechen Republic in 2018–2022 (per 1000 births)

Таблица 3

Заболеваемость беременных, связанная с нарушением кровеносной системы и осложнившая течение родов, в Российской Федерации и Чеченской Республике в 2018–2022 гг. (на 1000 родов)

Класс болезней / Class of diseases	**Территория / Territory**	**Годы / Years**					**Динамика (% и p) / Dynamics (% and p)**
		2018	**2019**	**2020**	**2021**	**2022**	
Существовавшая ранее гипертензия, осложняющая беременность, роды и послеродовый период / Pre-existing hypertension complicating pregnancy, childbirth and the puerperium	РФ / RF	46,90	47,88	46,42	46,33	48,01	+2,3; >0,1
	ЧР / CR	3,60	10,38	14,12	7,92	9,00	+60,0; >0,1
Преэклампсия средней тяжести и тяжелая / Moderate to severe preeclampsia	РФ / RF	35,80	39,91	37,72	38,74	37,00	+3,2; >0,1
	ЧР / CR	55,02	150,42	84,34	64,21	101,42	+45,8; <0,01
Эклампсия во время беременности / Eclampsia during pregnancy	РФ / RF	0,12	0,13	0,13	0,13	0,16	+25,0; >0,1
	ЧР / CR	0,24	0,14	0,31	0,17	0,17	–29,2; >0,1
Венозные осложнения / Venous complications	РФ / RF	22,60	23,6	24,3	26,3	25,21	+10,3; <0,05
	ЧР / CR	33,30	13,02	7,79	7,13	14,80	–55,6; <0,05
Анемия / Anemia	РФ / RF	255,72	263,27	261,72	258,14	248,91	–2,7; <0,01
	ЧР / CR	365,42	709,46	712,68	673,82	649,81	+43,8; <0,001
Болезни системы кровообращения / Diseases of the circulatory system	РФ / RF	53,01	52,73	48,10	47,37	46,39	–12,5; <0,01
	ЧР / CR	15,11	59,02	19,53	8,44	12,20	–19,2; >0,1

Table 4

The incidence of certain nosological forms in pregnant women, which complicated the course of childbirth, in the Russian Federation and the Chechen Republic in 2018–2022 (per 1000 births)

Таблица 4

Заболеваемость беременных отдельными нозологическими формами, осложнившая течение родов, в Российской Федерации и Чеченской Республике в 2018–2022 гг. (на 1000 родов)

Класс болезней / Class of diseases	**Территория / Territory**	**Годы / Years**					**Динамика (% и p) / Dynamics (% and p)**
		2018	**2019**	**2020**	**2021**	**2022**	
Предлежание плаценты, в том числе с кровотечением / Placenta previa, including bleeding	РФ / RF	5,64	6,16	5,99	6,13	6,77	+16,7; >0,05
	ЧР/ CR	2,59	3,27	2,88	4,3	4,56	+43,2; >0,1
Преждевременная отслойка плаценты / Premature placental abruption	РФ / RF	9,40	9,30	9,14	9,12	9,20	–2,1; >0,1
	ЧР / CR	12,40	11,81	13,79	12,52	12,20	–1,6; >0,1
Сахарный диабет / Diabetes	РФ / RF	60,64	76,23	86,18	101,8	113,91	+46,8; <0,01
	ЧР / CR	1,52	3,20	3,23	2,66	4,56	+66,7; >0,1
Инфекции мочеполовых путей / Urinary tract infections	РФ / RF	49,30	49,27	47,31	48,69	50,20	+1,8; >0,05
	ЧР/ CR	6,20	17,12	17,32	10,51	15,30	+59,5; >0,05

Republic it was revealed that the incidence of placenta previa increased 1.8 times (from 2.59 to 4.56‰), diabetes mellitus — 3. times (from 0.50 to 1.53‰) and genitourinary tract infections — 2.5 times (from 6.20 to 15.30‰), with a slight (–1.6%) decrease in premature placental abruption (from 12.40 to 12.20‰).

The proportion of normal births in the Chechen Republic, with the exception of 2019, was significantly higher (Fig. 3) than the Russian average ($p < 0.01$). The exceedance amounted to 1.4 times on average over the five analyzed years. Analyzing the dynamics it was revealed that the proportion of normal births in the country as a whole decreased by 2.9% (from 37.28 to 36.19%; $p < 0.05$), and in the Republic — by 1.2% (from 56.57 to 55.90%; $p > 0.1$).

In 2018–2022, the specific gravity of neonates with a birth weight less than 2,500 grams in the Chechen Republic (Fig. 4) was, on average, 1.5 times lower than in the Russian Federation ($p < 0.01$). Similarly to the dynamics of specific gravity of normal births, the proportion of children born with low birth weight decreased compared to the baseline level. However, the decrease amounted to 7.7% in the whole country (from 6.20 to 5.72%; $p < 0.01$), and only 1.0% — in the Chechen Republic (from 3.83 to 3.89%; $p > 0.1$).

The research revealed (Table 4) that there is a moderate inverse correlation between the infant mortality rate and the rate of prenatal care follow-ups in the Chechen Republic (r_{xy} –0.36 to –0.51 inclusive). Thus, increasing early coverage of prenatal care follow-ups, medical check-ups by a general practitioner, including visits before 12 weeks of pregnancy, and screening examinations is a factor that has a positive impact on reducing infant mortality in the Republic.

A moderate to strong inverse correlation (r_{xy} from –0.58 to –0.89 inclusive) was found (Table 5, 6) between infant mortality rates and the predominant majority of indicators of detectable diseases in pregnant women complicating the course of labor. Thus, increased detection of hypertension, preeclampsia, anemia, circulatory diseases, diabetes mellitus, and genitourinary tract infections results in reduced infant mortality.

CONCLUSION

1. A significant increase in the early coverage prenatal care follow-ups (+15.6%), check-ups by a general practitioner before 12 weeks of pregnancy (+13.2%), ultrasound (+26.0%) and biochemical screening (+21.0%) in the Chechen Republic's antenatal clinics has made it possible to raise these indicators above the national average by 2022.

2. The incidence of hypertension complicating pregnancy and childbirth (5.2-fold), circulatory diseases (2.2-fold), venous complications (1.6-fold), diabetes mellitus (28.9-fold), genitourinary tract infections (3.7-fold) and placenta previa, including hemorrhage (1.7-fold), was lower in the Chechen Republic compared to the Russian Federation. At the same time, there was a higher incidence of pre-eclampsia (moderate and severe) and anemia (2.4

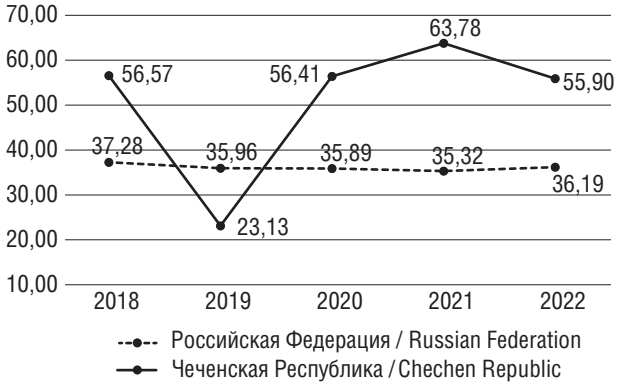

Fig. 3. Dynamics of the share of normal births in the Russian Federation and the Chechen Republic in 2018–2022 (per 1000 births)

Рис. 3. Динамика удельного веса нормальных родов в Российской Федерации и Чеченской Республике в 2018–2022 гг. (на 1000 родов)

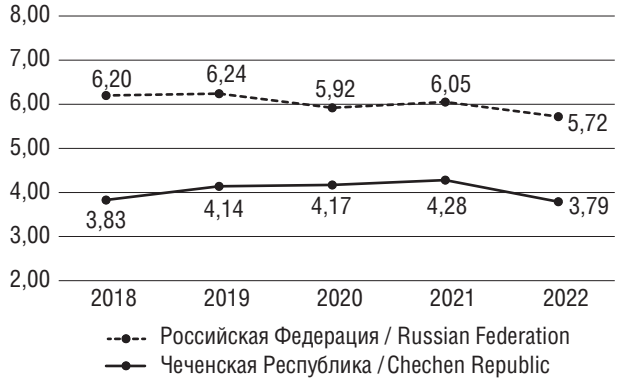

Fig. 4. Proportion of children born weighing less than 2500 grams in the Russian Federation and the Chechen Republic in 2018–2022 (in %)

Рис. 4. Удельный вес детей, родившихся с массой тела менее 2500 грамм, в Российской Федерации и Чеченской Республике в 2018–2022 гг. (в %)

Table 5

Assessment of the correlation between infant mortality rates and indicators of dispensary monitoring of pregnant women in the Chechen Republic in 2018–2022

Таблица 5

Оценка корреляционной связи между показателями младенческой смертности и показателями диспансерного наблюдения за беременными в Чеченской Республике в 2018–2022 гг.

Показатель / Index	**Чеченская Республика / Chechen Republic**	
	Коэффициент корреляции / Correlation coefficient (r_{xy})	**Направление и сила корреляционной связи / Direction and strength of correlation**
Ранний охват беременных диспансерным наблюдением / Early coverage of pregnant women with dispensary observation	–0,45	Обратная, умеренная / Reverse, moderate
Удельный вес беременных, осмотренных терапевтом до 12 недель / Proportion of pregnant women examined by a therapist before 12 weeks	–0,37	Обратная, умеренная / Reverse, moderate
Удельный вес беременных, осмотренных терапевтом / Proportion of pregnant women examined by a therapist	–0,49	Обратная, умеренная / Reverse, moderate
Охват ультразвуковыми исследованиями / Ultrasound coverage	–0,50	Обратная, умеренная / Reverse, moderate
Частота выявляемости плодов с врожденными пороками развития / Frequency of detection of fetuses with congenital malformation	–0,39	Обратная, умеренная / Reverse, moderate
Охват пробами на биохимический скрининг / Sample coverage for biochemical screening	–0,51	Обратная, умеренная / Reverse, moderate
Частота выявляемости женщин с отклонениями / Frequency of detection of women with abnormalities	–0,36	Обратная, умеренная / Reverse, moderate

times), eclampsia during pregnancy (1.3 times) and premature placental abruption (1.4 times).

3. More frequent detection of hypertension (2.5-fold), pre-eclampsia (1.8-fold) and anemia (1.8-fold) in the Republic lead to reduction of eclampsia (1.4-fold) and venous complications (2.3-fold). In addition, over five years, the Region demonstrated a 1.8-fold increase in the detection rate of placenta previa, a 3.0-fold increase in the detection rate of diabetes mellitus, and a 2.5-fold increase in the detection rate of genitourinary infections.

4. The lower incidence of fetal congenital malformations (1.7 times) and women with pregnancy abnormalities (3.9 times) observed in the Chechen Republic is a precondition for a consistently lower proportion of children born with a birth weight under 2,500 grams (1.5 times) and a high proportion of normal births (1.4 times) compared to the country.

5. The Chechen Republic, which has a high infant mortality rate, has shown an average decrease of 13.3% over the last five years. The research demonstrated that the increased coverage of specialized medical follow-ups and screening examinations lead to higher detection of diseases in pregnant women, enabling their timely correction.

Thus, improving the quality of prenatal follow-ups had a significant impact on reducing the infant mortality rate in the Region.

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.

Table 6

Assessment of the correlation between infant mortality rates and morbidity rates among pregnant women in the Chechen Republic in 2018–2022

Таблица 6

Оценка корреляционной связи между показателями младенческой смертности и показателями заболеваемости беременных в Чеченской Республике в 2018–2022 гг.

Показатель / Index	**Чеченская Республика / Chechen Republic**	
	Коэффициент корреляции (r_{xy}) / Correlation coefficient (r_{xy})	**Направление и сила корреляционной связи / Direction and strength of correlation**
Существовавшая ранее гипертензия / Pre-existing hypertension	–0,68	Обратная, умеренная / Reverse, moderate
Преэклампсия средней тяжести и тяжелая / Moderate to severe preeclampsia	–0,89	Обратная, сильная / Straight, moderate
Эклампсия во время беременности / Eclampsia during pregnancy	–0,12	Обратная, слабая / Reverse, weak
Венозные осложнения / Venous complications	0,48	Прямая, умеренная / Straight, moderate
Анемия / Anemia	–0,71	Обратная, сильная / Reverse, strong
Болезни системы кровообращения / Diseases of the circulatory system	–0,59	Обратная, умеренная / Reverse, moderate
Предлежание плаценты, в том числе с кровотечением / Placenta previa, including bleeding	–0,26	Обратная, слабая / Reverse, weak
Преждевременная отслойка плаценты / Premature placental abruption	0,16	Прямая, слабая / Straight, weak
Сахарный диабет / Diabetes	–0,83	Обратная, сильная / Reverse, strong
Инфекции мочеполовых путей / Urinary tract infections	–0,58	Обратная, умеренная / Reverse, moderate

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PECULIAR FEATURES OF PROVISION OF MEDICAL CARE TO THE POPULATION IN THE ARCTIC REGIONS OF THE REPUBLIC OF SAKHA (YAKUTIA)

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ABSTRACT. The organization of qualified and specialized medical care in the regions of the Arctic zone of the Russian Federation has its own peculiarities that require making professional decision at the federal and regional levels. In recent years, specific health problems in the regions of the Arctic zone of the Russian Federation have attracted close attention. On the example of the Republic of Sakha (Yakutia), peculiar features of the healthcare system in the context of medical and demographic indicators are presented. The article analyzes the official reports of the Yakut Republican Information and Analytical Center of the Ministry of Health of the Republic of Sakha (Yakutia) for the period from 2000 to 2021 in connection with a content analysis of medical and demographic indicators characterizing the features of medical care to the population in the Arctic regions of the Republic of Sakha (Yakutia). In the Arctic regions of the Republic of Sakha (Yakutia) in dynamics since 2000 the amount of the population that tends to decline, rather a low provision of medical personnel (doctors and secondary medical workers) and a high need for air ambulance is revealed. The above mentioned items highlight the urgent need for extraordinary measures in the organization of medical care in the regions of the Arctic zone of the Russian Federation. In this regard, the development of Arctic medicine, as a special direction, will allow solving issues at the state level: staffing in healthcare; provision of qualified and specialized medical care; validity of the use of air ambulance.

KEY WORDS: population size; provision by doctors; sanitary aviation; Arctic regions; Arctic medicine; Yakutia.

ОСОБЕННОСТИ МЕДИЦИНСКОЙ ПОМОЩИ НАСЕЛЕНИЮ В АРКТИЧЕСКИХ РАЙОНАХ РЕСПУБЛИКИ САХА (ЯКУТИЯ)

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РЕЗЮМЕ. Организация квалифицированной и специализированной медицинской помощи в регионах Арктической зоны Российской Федерации имеет свои особенности, требующие решения на федеральном и региональном уровнях. В последние годы к проблемам здравоохранения регионов Арктической зоны Российской Федерации приковано пристальное внимание. На примере Республики Саха (Якутия) представлены особенности системы здравоохранения в контексте медико-демографических показателей. В статье проведен анализ официальных отчетов Якутского республиканского информационно-аналитического центра Министерства здравоохранения Республики Саха (Якутия) за период с 2000 по 2021 гг. в сочетании с контент-анализом медико-демографических показателей, характеризующих особенности медицинской помощи населению в арктических районах Республики Саха (Якутия). Выявлено, что в динамике с 2000 г. в арктических районах Республики Саха (Якутия) сохраняется тенденция к снижению численности населения, достаточно низкая обеспеченность медицинскими кадрами (врачами и средними медицинскими работниками), высокая потребность в санитарной авиации. Все это указывает на необходимость неординарных решений в организации медицинской помощи в регионах Арктической зоны Российской Федерации. В этой связи развитие арктической медицины как особого направления позволит на государственном уровне решить вопросы кадрового обеспечения в здравоохранении, доступности квалифицированной и специализированной медицинской помощи, обоснованности использования санитарной авиации.

КЛЮЧЕВЫЕ СЛОВА: численность населения; обеспеченность врачами; санитарная авиация; арктические районы; арктическая медицина; Якутия.

INTRODUCTION

Providing qualified and specialized medical care to the inhabitants of the Arctic zone of Russia becomes especially significant and poses a problem of state importance [1, 5, 8, 9]. The Arctic regions of Russia need a certain independence in organizing and solving the main problems and tasks in providing medical care to the population in these territories. We believe that there are bold and sometimes extraordinary solutions in the field of Arctic medicine. The peculiarity of medical care in the Arctic regions is underpowered low-capacity hospitals, low availability of medical staff, high demand for qualified and specialized medical care, sanitary aviation, and on-site medical check-ups [3, 4, 7]. This is not the whole list of problems and tasks that require timely and immediate solution. Methodological approaches in the development and implementation of Arctic medicine are already being widely discussed in Russia [1, 2, 6, 8]. Undoubtedly, the joint efforts of health care organizers, practitioners, and scientists will improve the medical care in the Arctic.

AIM

To analyze main medical and demographic indicators in the Arctic regions of the Republic of Sakha (Yakutia) in order to determine main directions for improving the health care system in the regions of the Arctic zone of the Russian Federation by taking the Republic of Sakha (Yakutia) as an example.

MATERIALS AND METHODS

Official reports of the Yakutsk Republican Information and Analytical Center of the Ministry of Health of the Republic of Sakha (Yakutia) were analyzed for the period from 2000 to 2021. Content analysis was carried out.

RESULTS AND DISCUSSION

The study period is marked by a general decline in the population of the Arctic zone of the Republic of Sakha (Yakutia). Accordingly, the number of children's population is also decreasing. However, there is an increase in the number of population in certain districts — Oleneksky and Eveno-Bytantai districts. In addition, it is possible to establish some increase in the number of population in six municipalities: Anabarsky, Zhigansky, Momsky, Oleneksky, Ust-Yansky, Eveno-Bytantai in recent years (Table 1). It must be noted that the increase occurs in the districts where the traditional way of life is preserved.

97 medical organizations operate in the Arctic regions of the Republic of Sakha (Yakutia): 13 central district hospitals (CDH), 36 district hospitals (DH), 1 city hospital (CH), 7 outpatient clinics (MD), 8 tuberculosis dispensaries (TB), 31 rural medical posts with obstetric units (RMPOU), 1 rural medical post (RMP). These organizations are specialized in providing medical care in vast territories with low population density, which affects the completeness of both material and technical equipment and staffing.

Close attention to the Arctic exploration and the health of the population has positive aspects in better equipping medical organizations, as well as launching the construction of new buildings. Owing to the National Project

Table 1

Population dynamics in the Arctic regions of the Republic of Sakha (Yakutia) for 2000–2021, number of people

Таблица 1

Динамика численности населения в арктических районах Республики Саха (Якутия) за 2000–2021 гг., человек

Районы / Districts	Годы / Years						
	2000	2005	2010	2015	2020	2021	Динамика за 20 лет, % / Dynamics over 20 years, %
Абыйский / Abyysky	5228	4649	4112	4125	3949	3916	–25,1
Аллаиховский / Allaikhovsky	4421	3203	2904	2733	2697	2697	–39,0
Анабарский / Anabarsky	3757	4113	3682	3387	3653	3672	–2,3
Булунский / Bulunsky	10 420	9495	9366	8404	8513	8501	–18,4
Верхнеколымский / Verkhnekolymsky	6662	5314	4712	4287	4003	3984	–40,2
Верхоянский/ Verkhoyansky	15 928	12 695	11 765	11 528	11 059	10 989	–31,0
Жиганский / Zhigansky	4849	4187	4047	4246	4112	4179	–13,8
Момский / Momsky	5243	4699	4383	4218	3974	4051	–22,7
Нижнеколымский / Nizhnekolymsky	8147	5460	4879	4426	4260	4228	–48,1
Оленекский / Oleneksky	4206	4111	4026	3967	4247	4326	2,9
Среднеколымский / Srednekolymsky	9415	8240	7774	7497	7332	7312	–22,3
Усть-Янский / Ustyansky	15 097	9398	8262	7244	7008	7035	–53,4
Эв.-Бытантайский / Ev.-Bytantaysky	2783	2781	2811	2798	2845	2879	3,4
Итого по АР / Total by AR	96 156	78 345	72 723	68 860	67 652	67 769	–29,5
Всего по РС (Я) / Total by RS (Y)	962 479	950 668	949 400	956 896	971 996	982 000	2,0

"Health Care", a number of Arctic regions are undergoing modernization and complete re-equipment, as well as launching the construction of new buildings for hospitals and rural medical posts. Major repairs have been carried out in three health care organizations: the inpatient department of the Allaihov and Bulun CDHs, and the surgical department of the Ust-Yanskaya CDH. Modular constructions for outpatient clinics were delivered and installed in Nelemnoye village of Verkhnekolymsky ulus, Kyusyur village of Bulunsky District, Eginsk village of the Verkhoyansk District, Ust-Kuiga village of the Ust-Yansky District. A rural medical post with an obstetric unit (RMPOU) was set up in the village of Beryelyakh, Allaihovsky District.

The Arctic regions of the Republic of Sakha (Yakutia) (RS (Y)) still face a very serious problem with medical personnel. As shown in Table 2, the staffing with physicians in the Arctic regions of RS(Y) is 59.9% (76.2% in RS (Y)), and the staffing with mid-level medical personnel is 70.3% (82.3% in RS (Y)). Zhigansky and Oleneksky Districts have the highest rates of staffing with medical personnel (83 and 84.2%, respec-

Table 2

Staffing and staffing level in the Arctic regions of the Republic of Sakha (Yakutia)

Таблица 2

Штаты и укомплектованность в арктических районах Республики Саха (Якутия)

Районы / Districts	Врачи / Doctors				Средний медперсонал / Medical nurses			
	Штатные, единицы / Staff, units	Физические лица, чел. / Individuals, number	Укомплектованность, % / Staffing,%	Обеспеченность на 10 000 нас. / Availability per 10,000 pop	Штатные, единицы / Staff, units	Физические лица, чел. / Individuals, number	Укомплектованность, % / Staffing, %	Обеспеченность на 10 000 нас. / Availability per 10,000 pop
Абыйский / Abyysky/	29	15	51,7	37,7	72	64	88,9	160,8
Аллаиховский / Allaikhovsky	22	11	50,0	40,6	48,5	34	70,1	125,6
Анабарский / Anabarsky	18,75	9	48,0	25,0	38,5	30	77,9	83,4
Булунский / Bulunsky	56,25	26	46,2	31,2	141	79	56,0	94,7
Верхнеколымский / Verkhnekolymsky	27,5	15	54,5	37,0	65,25	39	59,8	96,3
Верхоянский / Verkhoyansky	61,5	37	60,2	33,2	209,25	155	74,1	139,2
Жиганский / Zhigansky	26,5	22	83,0	52,7	58,5	46	78,6	110,1
Момский / Momsky	22	16	72,7	40,3	70,5	58	82,3	146,0
Нижнеколымский / Nizhnekolymsky	35,25	19	53,9	44,3	97,5	50	51,3	116,6
Оленекский / Oleneksky	28,5	24	84,2	57,9	61,5	52	84,6	125,4
Среднеколымский / Srednekolymsky	47,25	31	65,6	41,8	117,25	100	85,3	134,7
Усть-Янский / Ustyansky	59,25	34	57,4	48,4	153	81	52,9	115,3
Эв.-Бытантайский / Ev.-Bytantaysky	14	9	64,3	31,8	33	31	93,9	109,7
Итого по АР / Total by AR	448	268	59,9	39,6	1165,75	819	70,3	121,0
Всего по РС (Я) / Total by RS (Y)	6489,5	4947	76,2	51,2	13 414,5	11 044	82,3	114,2

tively). The lowest staffing levels are in the Bulun and Anabar Districts (46.2 and 48% respectively).

There are opportunities for training medical personnel in RS (Y) on the basis of the Medical Institute of the M.K. Ammosov North-Eastern Federal University, as well as on the basis of five secondary professional organizations that train mid-level medical personnel. Thus, there is a great potential to ensure sufficient staffing levels. However, the issues of attracting and especially attaching personnel in the Arctic regions are very acute and require serious social and economic changes at the state level.

Taking into account low coverage of medical institutions in the Arctic, as well as climatic and geographical peculiarities (lack of permanent land and water communication), it is especially urgent, relevant and reasonable to use air ambulance on the vast territory of RS (Y) with its hard-to-reach areas. As shown in Table 4, 30.3% of air ambulance calls are made from the Arctic regions, and the ratio of air ambulance use per each resident of the Arctic regions of the Republic of Sakha (Yakutia) is 5:1 to residents of other regions.

In total, 804 sanitary missions were submitted in the Republic of Sakha (Yakutia) in 2021, and 1,511 patients were evacuated. Among them, 423 sanitary assignments were performed in Yakutsk city, 662 patients were evacuated (2020 — 241 sanitary assignments, 360 patients were evacuated), intra-district evacuations — 235 sanitary assignments, 528 patients were evacuated (2020 — 55 assignments, 98 patients), inter-district evacuations — 145 sanitary assignments, 320 patients were evacuated (2020 — 38 assignments, 45 patients) (Table 3).

The largest number of patients was evacuated from the Arctic group of districts/units — 459 patients (2020 — 141 patients).

In 2021, COVID-19 took the first place in the specific weight of all diseases which required medical evacuation in the Republic of Sakha (Yakutia). Compared to 2020, the number of evacuated patients in 2021 has increased 3 times — 1511 patients (2020 — 503 patients).

On average, air ambulance service indicator is 5 times higher in the Arctic regions than in the Republic. The highest indicators of air ambulance service to the population are observed in the following districts Abyisky, Bulunsky, Verkhoyansky, Nizhnekolymsky, Oleneksky, Srednekolymsky, Eveno-Bytantaysky (Table 4).

Table 3

Dynamics of the number of sanitary tasks and evacuated patients by groups of districts/uluses of the Republic of Sakha (Yakutia)

Таблица 3

Динамика количества санитарных заданий и эвакуированных больных по группам районов/улусов Республики Саха (Якутия)

№	Группа районов / Group of districts	2020 г.		2021 г.	
		Количество санитарных заданий / Number of san.tasks	Количество больных / Number of patients	Количество санитарных заданий / Number of san.tasks	Количество больных / Number of patients
1	Арктическая группа / Arctic group	81	141	230	459
2	Северная группа / Northern group	22	25	51	117
3	Юго-Западная группа / South-West group	63	98	144	232
4	Заречная группа / Zarechnaya group	82	121	165	246
5	Вилюйская группа / Viluyskaya group	73	91	198	437
6	Центральная группа / Central group	15	27	16	20
	ИТОГО / TOTAL	336	503	804	1511

Table 4

Dynamics of the indicator of air ambulance service for the population of the Arctic regions of the Republic of Sakha (Yakutia) (number of calls for sanitation per 1000 population)

Таблица 4

Динамика показателя обслуживания санитарной авиацией населения арктических районов Республики Саха (Якутия) (число вызовов санавиации на 1000 населения)

Районы / Districts	Годы / Year					
	2000	2005	2010	2015	2020	2021
Абыйский / Abyysky/	5,5	7,1	3,7	6,3	7,6	11,3
Аллаиховский / Allaikhovsky	6,8	11,4	4,0	3,7	5,6	9,7
Анабарский / Anabarsky	0,8	5,4	4,8	5,9	5,5	3,6
Булунский / Bulunsky	0,7	8,9	10,2	9,8	7,9	12,8
Верхнеколымский / Verkhnekolymsky	0,9	3,3	4,7	8,9	3,5	5,6
Верхоянский / Verkhoyansky	1,2	9,0	6,8	7,9	10,0	14,2
Жиганский / Zhigansky	8,1	5,2	2,2	1,6	2,9	2,4
Момский / Momsky	1,7	4,3	4,0	5,5	6,3	9,0
Нижнеколымский / Nizhnekolymsky	1,7	2,9	3,8	5,0	6,3	11,5
Оленекский / Oleneksky	3,5	2,7	4,2	9,1	10,8	17,1
Среднеколымский / Srednekolymsky	2,1	10,5	13,1	8,4	9,1	13,3
Усть-Янский / Ustyansky	0,7	9,2	5,1	7,6	9,3	8,1
Эв.-Бытантайский / Ev.-Bytantaysky	2,8	7,9	12,2	9,0	5,6	12,5
Итого по АР / Total by AR	2,8	6,7	6,1	6,8	6,9	10,08
Всего по РС (Я) / Total by RS (Y)	1,5	1,5	1,4	1,6	1,9	2,4

CONCLUSION

The problem of providing medical care to the population in the regions of the Arctic zone of the Russian Federation acquires special significance. Development of the Arctic territories and industrial activity make their contribution to the process. The analysis of medical service indicators in the Arctic regions of the Republic of Sakha (Yakutia) has shown following positive features: there are areas with positive dynamics in population growth; there are areas with sufficiently high indicators of medical personnel availability; there is a high need for air ambulance. Year after year, there are districts where these indicators are higher than average for the Republic of Sakha (Yakutia) and for the Arctic regions in particular. The overall picture is quite unstable, and the share of districts with negative population dynamics and low availability of medical personnel is also high, which requires extraordinary solutions. Accordingly, the Republic of Sakha (Yakutia) has elaborated a program for the development of Arctic medicine. This program includes several areas: first of all, the creation and development of the Republican Center for Mobile Brigades to provide specialized medical care; the training of qualified medical personnel, their distribution and retention in the field; and the widespread use of air ambulance and information technologies, including telemedicine.

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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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VACCINATION AGAINST COVID-19 THROUGH THE EYES OF MEDICAL WORKERS — CURRENT VIEW OF THE PROBLEM PREVENTIVE MEDICINE

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ABSTRACT. The period of creation of vaccines against COVID-19 and their implementation was distinguished not only by lack of scientific knowledge in the field of epidemiology of the infection, the nature of immunological protection, data on effectiveness/safety, practical basis for vaccines use, etc., but also by the competitive regime of vaccine development, accompanied by both real facts of compromise solutions, and unregulated discrediting of competitors' vaccines and huge negative information impact by creating a stereotype of mistrust and skepticism. ALL this caused public disorientation regarding vaccines/vaccination and did not promote true adherence to it. In this work, attention is drawn to the most socially vulnerable professional group of medical workers directly involved in mass vaccination, in order to study the opinions of doctors of different specialties on the issues of vaccine prevention in the context of vaccination against COVID-19. The methodical implementation of the goal was provided by the development of a special questionnaire, conducting an express survey of respondents and the use of adequate statistical methods for assessing the received materials. The analysis of the study results revealed differences in the motivation of doctors for their own vaccination (voluntarily or by order), depending on their status and professional experience, due to a significant difference in assessing the quality of vaccines (availability, safety and immunogenicity), based on the fact of the dominant use of domestic vaccines the common Sputnik V platform, as well as the limit of objective data for dynamic monitoring of all classes of vaccines. Consideration of the range of fluctuations in the opinions of doctors on a number of issues related to the vaccination procedure itself, informing patients, satisfying their rights to make choice, autonomy and confidentiality, revealed the need to improve the training system and introduce a feedback mechanism. The reasoned position of doctors on the goals of mass vaccination and the reasons for patients' refusal to vaccinate is concerned. In terms of commitment to mandatory or voluntary vaccination to ensure the formation of an adequate level of collective immunity against COVID-19, the attitude of doctors spread out approximately equally. In general, the article submitted for publication is a real source for drawing up an algorithm for effective measures of motivational and professional training of specialists for conducting vaccine prevention in routine and emergency epidemiological conditions.

KEY WORDS: vaccine prevention; vaccines against COVID-19; adherence to vaccination; doctors' opinions on routine vaccination and vaccination against COVID-19.

ВАКЦИНАЦИЯ ОТ COVID-19 ГЛАЗАМИ МЕДИЦИНСКИХ РАБОТНИКОВ — АКТУАЛЬНЫЙ ВЗГЛЯД НА ПРОБЛЕМУ ПРОФИЛАКТИЧЕСКОЙ МЕДИЦИНЫ

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РЕЗЮМЕ. Период создания вакцин против COVID-19 и этап их применения отличался не только дефицитом научных знаний в области эпидемиологии инфекции, характера иммунологической защиты, данных по эффективности/безопасности, практической базе их применения и другим, но и соревновательным режимом разработки вакцин, сопровождающимся как реальными фактами компромиссных решений, так и нерегулируемой дискредитацией вакцин конкурентов и огромным отрицательным информационным воздействием путем создания стереотипа недоверия и скептицизма. Это вызвало дезориентацию общества в отношении вакцин/вакцинации, не способствовало истинной приверженности к ней. В настоящей работе внимание обращено к наиболее социально уязвимой профессиональной группе медицинских работников, непосредственно участвующих в массовой вакцинации, с целью изучения мнения врачей разных специальностей по вопросам вакцинопрофилактики в условиях вакцинации против COVID-19. Методическое осуществление цели было обеспечено разработкой специальной анкеты, проведением экспресс-опроса респондентов и применением адекватных статистических методов оценки полученных материалов. В ходе анализа результатов исследования выявлены различия в мотивации к собственной вакцинации врачей (добровольно или по приказу), в зависимости от статуса и профессионального опыта, обусловленные достоверным различием в оценке качества вакцин (доступность, безопасность и иммуногенность), базирующимся на факте доминанты применения отечественных вакцин общей платформы Спутник V, а также лимитом объективных данных динамического наблюдения за всеми классами вакцин. Рассмотрение диапазона колебаний мнения врачей по сумме вопросов, касающихся непосредственно процедуры вакцинации, информирования пациентов, удовлетворения их прав на выбор, автономию и конфиденциальность, выявило необходимость совершенствования системы подготовки медицинских работников и введения механизма обратной связи. Продемонстрирована аргументированная позиция врачей по вопросам целей массовой вакцинации и причин отказа пациентов от вакцинации. В плане приверженности обязательной или добровольной вакцинации для гарантии формирования адекватного уровня коллективного иммунитета против COVID-19 отношение врачей разделилось примерно поровну. В целом представленная к публикации статья является реальным источником составления

алгоритма действенных мер мотивационной и профессиональной подготовки специалистов для проведения вакцинопрофилактики в обычных и чрезвычайных эпидемиологических условиях.

КЛЮЧЕВЫЕ СЛОВА: вакцинопрофилактика; вакцины против COVID-19; приверженность к вакцинации; мнение врачей о рутинной вакцинации и вакцинации против COVID-19.

INTRODUCTION

On 11 May 2023, the World Health Organization (WHO) declared the end of the COVID-19 pandemic, but its global damage to the world health system and extraordinary socio-ethical upheavals of the pandemic has to be analyzed. It is still necessary to make conclusions that could neutralize post-pandemic threats in all spheres of public health. Vaccination has become a kind of "mirror" in which social and ethical problems are reflected with particular force. A great number of medical and news reports clearly demonstrate that there was a deep moral breakdown affecting all layers of civil society, starting from the development and creation of vaccines and ending with evaluation of vaccination effects [10, 32]. The dynamic exploration of various aspects of the phenomenon, in turn, has defined the area of our professional attention at all stages of vaccination.

A special commitment is to turn inside the profession and understand the role of health practitioners. Health care workers took the whole gravity of the pandemic and participated not only professionally, but personally — they were losing loved ones and colleagues, experienced a lack of objective data and were in the social informational field of fear and anxiety. Health practitioners faced moral frontier of duty and decision-making on vaccination for their patients band themselves. The first line of vaccination of the population and various work collectives were city outpatient clinics. It was necessary to organize and implement vaccination in a short period of time, which required the mobilization of organizational, medical, educational resources and great moral efforts.

AIM

To study medical specialists' opinion concerning vaccination for COVID-19.

MATERIALS AND METHODS

This study was carried out in a number of city outpatient clinics in St. Petersburg, where the population was vaccinated against COVID-19 between December 2020 and April 2023. In order to perceive the methodological format of the research, general specificity of mass vaccination against COVID-19 should be taken into account. Prerequisites for achieving higher vaccination coverage were: availability of regulatory framework, availability of vaccines, public awareness to increase vaccination adherence, improvement of logistics and infrastructure of the vaccination process. In practical terms, it involved developing new and adapting existing federal guidelines and regulations, implementing them, creating a guaranteed stock of vaccines, ensuring their quality storage and rational use. In addition, it was obligatory to implement a diverse level of contact and notification of population, to change routine vaccination practices, to introduce new logistics chains, which, in turn, required constant and regular training of the personnel involved. The high level of dynamic tension in the sphere of regulation and ethical support of medical and epidemiological activities during the COVID-19 pandemic determined the relevance of the study reflecting the social and moral cross-section of COVID-19 vaccination.

The above-mentioned provisions formed the base of the system, which determined the conditions of our health workers' survey conducted at the end of 2022, the second year of the mass immunization campaign. A special questionnaire was developed for this purpose. There was made an attempt to cover all links in immunization organization which were designed to ensure the most important factors for the formation of trust in vaccination — effectiveness, safety, normative and ethical justification. It was essential to choose a specific working group of observation and to take into account the factors which might influence the choice of a physician and his decision. These aspects constituted the methodological part of the research.

The survey was conducted among physicians who were directly involved in vaccination during the pandemic. They solved complex clinical tasks that required difficult moral conside-

rations on a daily basis, sometimes choosing between the provisions of recommendation documents and their own uncertainty about the correctness of their decisions. The departments where the respondents worked were adult and pediatric outpatient clinics, antenatal clinics, and emergency departments.

138 questionnaires were handed out. However, only 100 physicians took part in the voluntary anonymous survey, despite being informed in advance, obtaining the respondent's consent to participate in the study and detailed explanations of the purpose and objectives of the questionnaire. 60.0% of the respondents worked in outpatient service (pediatricians and therapists) and children's educational institutions, 10.0% worked in the administration of outpatient clinics, and 30.0% were narrow medical specialists. Distribution by length of service showed the following: 61.0% of respondents had more than 10 years of work experience, 24.0% — up to 5 years, 15.0% — 5–10 years. It is important to note that 75.0% of respondents had experience of participation in vaccination before the COVID-19 pandemic within the framework of implementation of the National Calendar of Preventive Vaccinations and the calendar of preventive vaccinations for epidemic indications.

Statistical processing was performed by means of STATISTICA software for Windows, v.10 (StatSoft, USA) using parametric and nonparametric criteria. Descriptive characteristics were calculated for each group: frequency of occurrence of a sign (for discrete signs), mean value of the indicator (M), standard deviation (σ), mean error (m), minimum, maximum, median and quartiles for signs with continuous distribution.

Categorical data are presented as relative (fractions, %) and absolute values; significance of differences was assessed using the χ^2 criterion with Yates correction. When it was necessary to detail the information, the proportion of positive responses was calculated by various characteristics: length of service, medical specialization, and subdivision. Since the quantitative data did not obey the law of normal distribution (according to the Kolmogorov–Smirnov criterion), they are presented in the form of median (Me) and interquartile range (Q1–Q3).

Multiple logistic regression analysis was used to identify factors associated with vaccination refusal. The odds ratio was determined, reflecting the closeness of association between feature A and feature B in a certain statistical population. Differences were considered statistically significant at a value $p < 0.05$. Physicians who reported a negative evaluation to vaccination were entered into the regression model as a dependent dichotomous variable (in the results). Graphs and charts were constructed in Excel and GraphPadPrism programs.

The analysis of questionnaire materials and statistical data was carried out sequentially according to the order of questions and sections of the questionnaire.

The protocol of the research and the "Doctor's Questionnaire" were submitted for ethical examination and were approved by the Local Ethics Committee (LEC) of the Medical Institution (the LEC session protocol of the St. Petersburg State Budgetary Institution of Public Health, City Outpatient Clinic No. 88 dd. 08.09.2022, No. 10).

RESULTS AND DISCUSSION

First of all, the analysis of the obtained data showed that all medical personnel were involved in the vaccination of the population against COVID-19, regardless of doctors' specialization.

When professional duties of respondents were clarified, it turned out that 14.0% were responsible for organizational issues of immunization, 75.0% — were directly involved in the procedure of admission to vaccination.

Certainly, we were interested in physicians' answers to the survey question: "*Have you been vaccinated against COVID-19? If yes, was this vaccination compulsory, i.e. related to work, to necessity of other kind or was it a personal decision?"*. In order to correctly perceive the answer to this question, it should be taken into account that the personal commitment of health workers to vaccination is based on the postulate of the irrefutable positive impact of immunization on an epidemic situation in terms of historical and current experience in the control and elimination of a number of manageable infections [7, 20]. Another level of the system is fulfillment of duties, execution of orders and the balance of different kinds of responsibilities that are specific for health care: professional, social and personal ones. Regarding the correlation of these parameters, it should be kept in mind that the personal responsibility of a medical professional cannot be completely separated from the other two, since medical duty requires personal protection in the aspect of correct anti-epidemic

behavior [6]. That is why it seems important to assess the results of the survey. Thus, among the respondents, only 77.0% of physicians were vaccinated against COVID-19. Among the vaccinated physicians, 61.0% were vaccinated voluntarily and 39.0% — compulsorily. According to the answers, 100% of outpatient clinic administration employees were vaccinated voluntarily. Figure 1 shows the analysis of respondents' answers depending on the length of service and specialty. 57.0% of general practitioners and 61.0% of pediatricians were vaccinated voluntarily (p=0.29). Physicians with more experience who were directly involved in treatment of patients with COVID-19 or who observed contacted individuals (general practitioners and pediatricians) were less committed to vaccination: 48.0% of physicians with more than 10 years of experience were vaccinated voluntarily; 73.0% of physicians with 5 to 10 years of experience; and 68.0% with less than 5 years of experience (p=0.01).

Attitude towards vaccination is far from 100% positive. It can be explained by the general

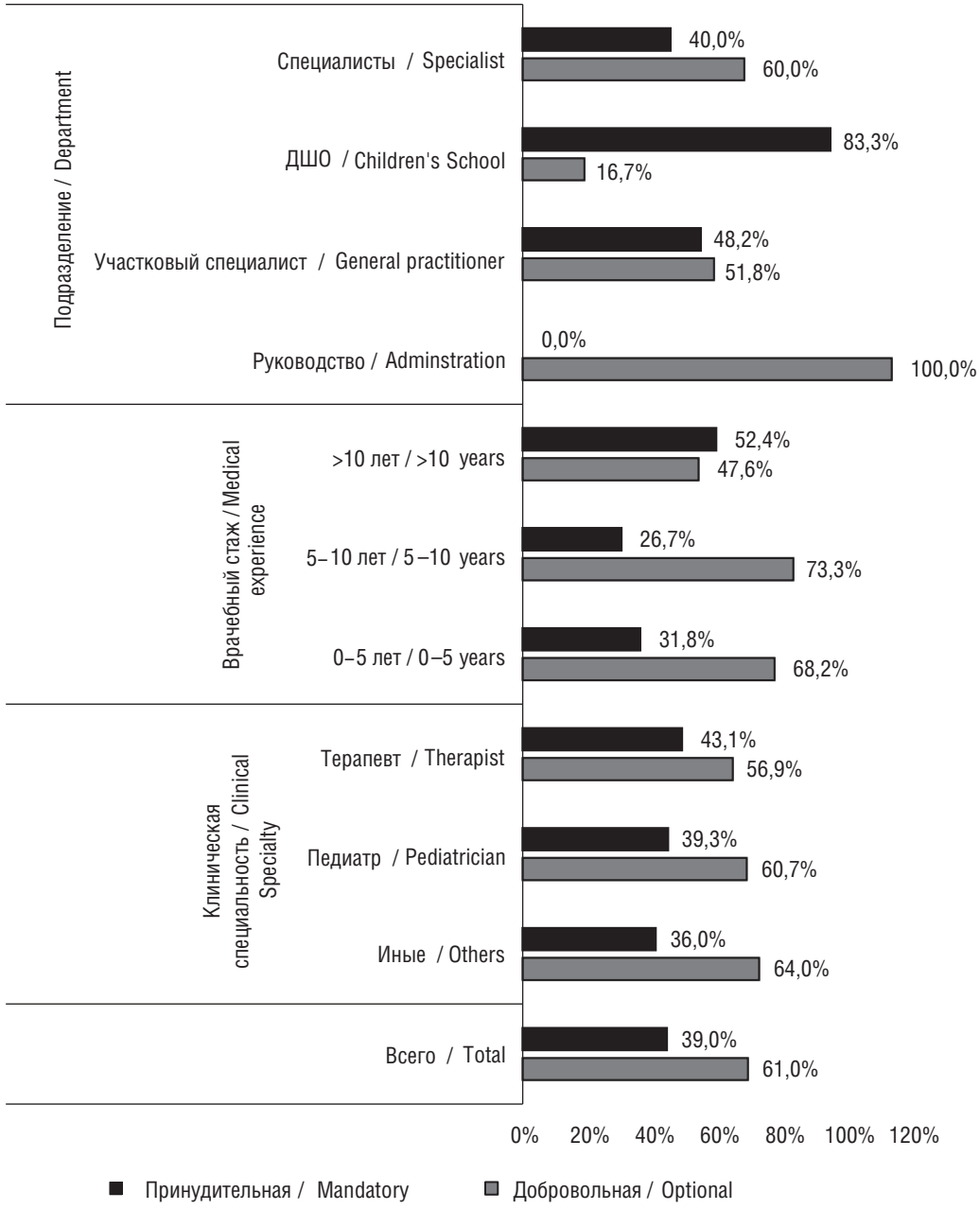

Fig. 1. Attitude of doctors to vaccination against COVID-19 depending on the specialty and work experience of the respondents

Рис. 1. Отношение врачей к вакцинации от COVID-19 в зависимости от специальности и стажа работы респондентов

failure of providing reliable data on vaccines and the infection itself, and by the unprecedented aggression and negativism towards vaccination in mass media. At the same time, there was a sharp division of both people's opinion, and a number of authoritative representatives of professional and religious communities, which have a powerful resource of influence, which was previously shown in a series of publications, including authors' ones [9, 10, 32, 33].

The method of multiple logistic regression analysis was used to study physicians' refusals to vaccinate. Figure 2 shows the odds ratio reflecting the strength of association between physicians' refusal to voluntary vaccination and the parameter, according to results of multiple logistic regression analysis. Factors that increase the probability of refusal are highlighted in red, those that decrease it are highlighted in green, and those that have no influence are highlighted in blue.

The results demonstrate that the most significant factor leading to a higher probability of refusal was a low assessment of the quality of the administered drug, both in terms of its safety (increasing the probability of refusal 2.4-fold) and immunogenicity (increasing the probability of refusal 4.13-fold). The strength of correlation between physicians' refusal of voluntary vaccination and their length of service and specialty was also shown. General practitioners (OR=2.3±1.1) with less than 5 years of experience (OR=2.67±0.71) refused to vaccinate more often.

Negative attitudes towards the vaccine administered and doubts about its quality also reduced odds of voluntary vaccination (OR=1.49±0.31

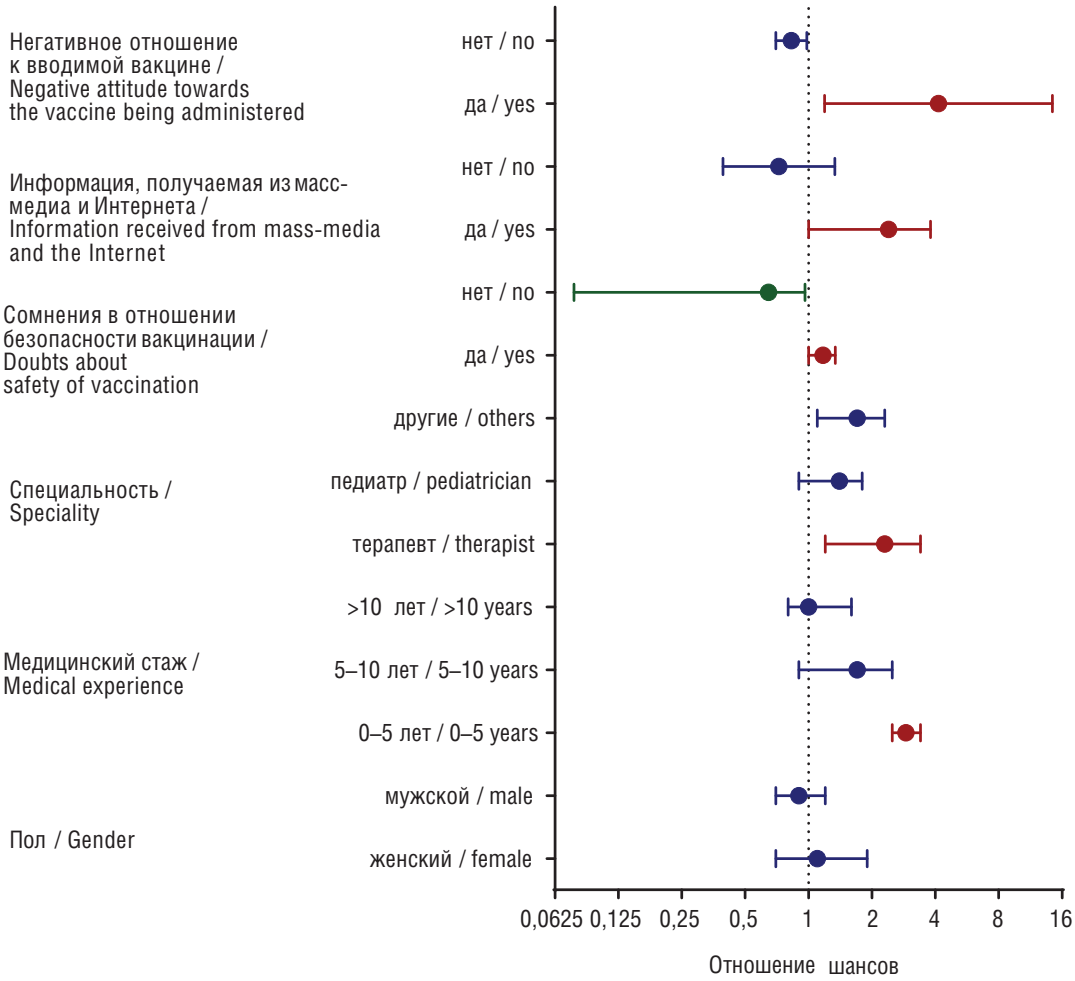

Fig. 2. Odds ratio of doctors refusing voluntary vaccination against COVID-19 depending on specialty, length of service and gender of respondents

Рис. 2. Отношение шансов отказа врачей от добровольной вакцинации против COVID-19 в зависимости от специальности, стажа и пола респондентов

and OR=4.27±1.27). Physicians' decision on voluntary vaccination was significantly influenced by information obtained from the media and the Internet (OR=2.12±0.43).

An important part of the questionnaire was the section "Legal Basis of Vaccination Prevention". When analyzing physicians' answers to this section, it is advisable to take into account the following realities of the legislation of the Russian Federation (RF). The stable legal framework of the Russian Federation is able to ensure the quality and effectiveness of each stage of vaccination and guarantee compliance with universal ethical principles when it is carried out in a routine, non-extreme mode [31]. The basic principles and provisions regulating vaccination prevention in the Russian Federation are defined in the Federal Law (FL) of 17.09.1998 No. 157-FZ "On Immunological Preventions of Infectious Diseases". These principles are reflected in the 'Practical Manual', in the current version of the National Calendar of Preventive Vaccinations and the Calendar of Preventive Vaccinations for Epidemic indications, which is available to every specialist involved in vaccination [14]. Knowledge of these provisions is a part of professional duties of every physician. It constitutes the basic legal and ethical foundation of vaccination prevention [2–4, 17–19]. According to the questionnaire data, the majority of the surveyed physicians (94.0%) believed that they were quite familiar with the provisions of national legislation on vaccination prevention. When specifying the sources of information, 59.0% of respondents mentioned relevant seminars in their area of expertise, 32.0% reported that they studied documents on their own, 4.0% were guided by mass media, 3.0% — by medical brochures, and 2.0% — by reports of opinion leaders.

Only 56.0% of respondents expressed their opinion on the way how basic principles of vaccination prevention are implemented in practice. Among them, 75.0% believed that the population is objectively informed, the principle of voluntariness is observed, and the effec-

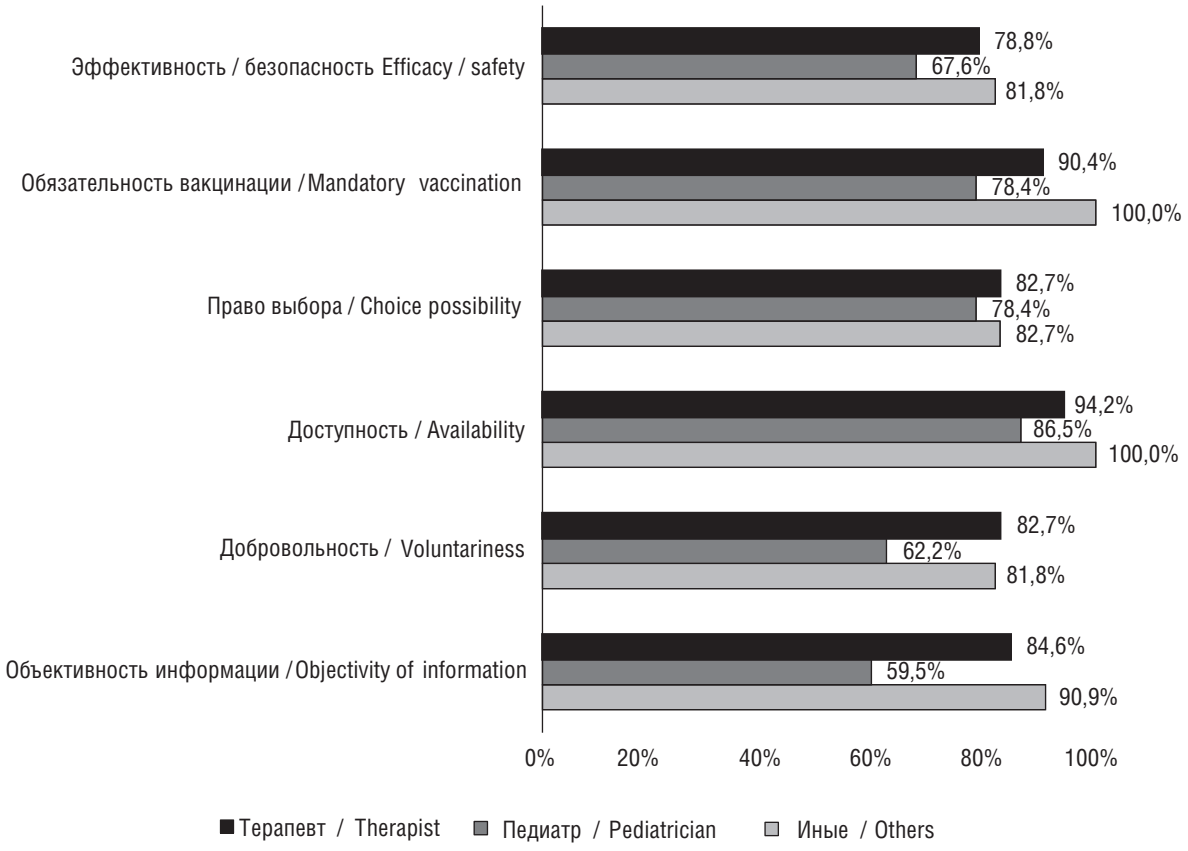

Fig. 3. Distribution of responses from doctors of various specialties regarding the implementation of vaccination principles

Рис. 3. Распределение ответов врачей разных специальностей относительно реализации принципов вакцинации

tiveness and safety of vaccination is monitored and recorded; 92.0% noted its accessibility; 82.0% believed that the patient's right to choose a medical institution and vaccine is exercised; and 87.0% believed that vaccination of persons with certain professions is mandatory. Figure 3 shows the opinion of different specialists concerning implementation of vaccination principles. The most positive answers regarding the observance of principles were received from general practitioners and other specialties, in contrast, pediatricians reported that these principles were observed less frequently. Unfortunately, physicians did not provide explanations for their answers.

It should be noted that with regard to vaccination tactics, the COVID-19 pandemic period was not a common situation and was more vulnerable in terms of the legal competence of physicians. Health workers were in extreme conditions both physically (due to the lack of human, time and material resources), morally and intellectually (due to the lack of sufficient reliable and tested data), and legally. Namely, due to the extraordinary nature of current lawmaking, such a term as "viral jurisprudence" appeared in legal doctrine [21]. As a result of emergency conditions, situational legislation was formed, which established a special regime of interaction between the state and the population with significant restrictions on the rights of citizens and organizations, redistribution of powers between public authorities, which, in turn, affected the legitimacy of decisions [5, 12].

Many issues which ought to be subjects of legal regulation at the level of the lawmaking, were in fact resolved by subordinate normative acts. In normal conditions of society functioning, this factor shifts the balance of the three branches of power towards the executive one. According to 2022 data, the number of bylaws at the federal level was 14 times higher than the number of adopted federal laws. The total number of acts approved at the federal level alone was 855 documents, including 388 normative legal acts and 451 documents of recommendatory and informational nature. Among these documents there are 25 federal laws, 16 decrees of the President of the Russian Federation, 119 resolutions of the Government of the Russian Federation [21]. Many physicians do not have sufficient knowledge of the fundamental legal basis of vaccination prevention, so that navigating in such a large array of new documents, which are questionable, is especially difficult. Legislative restrictions have affected not only freedom of movement, available social services, education, security, family life, protection of personal data and labor guarantees, but also such rights as respect for human dignity and voluntary participation in a medical experiment, which are recognized as natural, inalienable and guaranteed by the highest law — the Constitution of the Russian Federation. Legal conflicts were obvious not only to professional lawyers, but also to a competent medical community. This fact definitely did not contribute to a strong commitment to promote COVID-19 vaccines among physicians. Moreover, it generated distrust of public health care in society [1].

The responsibility of physicians to develop positive attitudes towards vaccination is essential. 64.0% of respondents in our study acknowledged this importance, including 67.6% of pediatricians, 90.0% of medical specialists and 75.0% of general practitioners.

Before analyzing and interpreting the answers concerning attitude to vaccination. It must be mentioned that vaccines have been created as a tool to restrain the pandemic, which was legitimate, justified and socially demanded [9, 10]. More than 122,100 doses of Gam-COVID-Vac (Sputnik V), more than 300 doses of Gam-COVID-Vac-M, more than 19,900 doses of Sputnik Lite, more than 2,840 doses of EpiVac-Corona and more than 3,030 doses of CoviVac were used during the implementation of the mass immunization program against COVID-19. The data is provided by one of the institutions participating in the study, according to the 'Official Daily Statistical Report of the Institution "Primary Report on Form 40 COVID-19". The above list convincingly demonstrates the numerical dominance of vaccines belonging to the common platform "Sputnik V" (Gam-COVID-Vac, Gam-COVID-Vac-M, Sputnik Lite), amounting to more than 142,300 doses in total. The ratio was 50 and 47 times higher compared to other classes of vaccines, such as EpiVac-Corona and CoviVac, respectively. This correlation was important in clarifying physicians' attitudes towards Russian-made vaccines against COVID-19, based on the main criteria of vaccine quality: efficacy, safety and availability of the drugs.

According to the respondents' answers (Fig. 4), Sputnik V and Sputnik Lite vaccines were identified as the most available: 97.0 and 84.0%, respectively. The same vaccines were also identified as the most effective: 88.0 and 81.0%, respectively. We can interpret these results as an objective opinion, as the number of doses of vaccines used during the vaccination campaign allowed us to form the physicians' attitude towards the vaccine in terms of tolerability. 89.0 and 87.0% of physicians were confident in their safety. However, the EpiVacCorona vaccine was rated the safest (98.0%), and 74% of physicians were confident in the safety of the CoviVac vaccine (p=0.00028), although the number of products used was very limited. Moreover, many physicians did not work with them. It is difficult to say how physicians determined the efficacy of the CoviVac and EpiVacCorona vaccines, rating them 66.0 and 59.0% (p=0.31), respectively, as their experience was also limited both by the quantity of the vaccines, and often by the lack of actual surveillance practice. In our opinion, indicators concerning CoviVac and EpiVacCorona vaccines cannot be objective since groups of vaccinated people were small: during two years only 1349 people were vaccinated with EpiVacCorona vaccine and 1314 — with CoviVac vaccine.

The formation of physicians' opinion about vaccines is facilitated by positive information support [27]. However, there were no publications on the results of official studies in relation to effectiveness and safety of the vaccines during mass vaccination against COVID-19. Such sources were not accessible to a wide range of physicians. The lack of objective information contributed to a skeptical attitude of medical specialists towards vaccines which led to low adherence to vaccination [13, 15, 22–24]. Similar facts have been demonstrated in a number of studies conducted in other countries [26, 28].

Respondents were also asked to evaluate foreign vaccines against COVID-19. Figure 5 shows that only a small number of respondents expressed their opinion about the vaccines, and mostly respondents answered honestly: "I don't know'. When asked: "Which of the foreign vaccines would you like to have in your arsenal?", the respondents preferred the Pfizer vaccine.

The survey also involved investigation of the ability to choose one or another domestic vaccine against COVID-19 when admitting a patient to vaccination, as well as the physicians' arguments for making this choice. It was established that 72.0% of respondents were able to choose a vaccine. 83.3% of the above-mentioned were guided by medical indications, and 81.9%

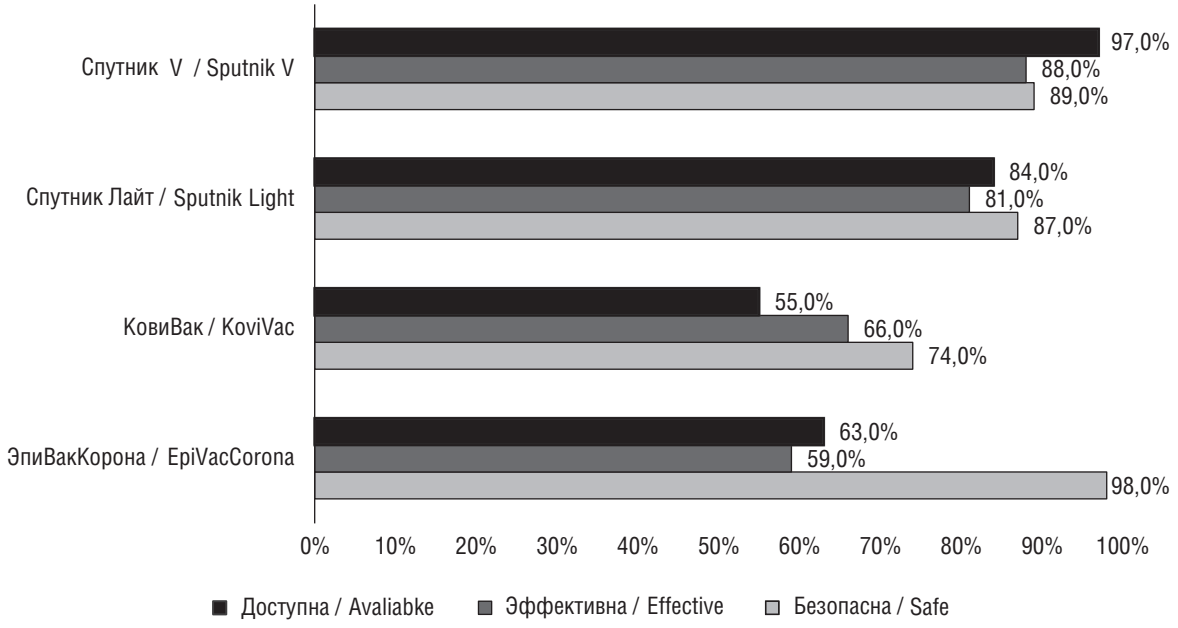

Fig. 4. The attitude of doctors towards Russian-made vaccines against COVID-19, depending on the main criteria for the quality of vaccines

Рис. 4. Отношение врачей к вакцинам российского производства против COVID-19 в зависимости от основных критериев качества вакцин

took into account patient's wishes. Commenting on the answers to this question, it should be emphasized that doctors were primarily guided by compliance with drug instructions and clinical recommendations, respecting the patient's right to choose a drug at the same time. It is important to note that regulatory documents of the Ministry of Health of the Russian Federation regulating the procedure of vaccination against COVID-19, as well as instructions for the use of specific vaccines, were regularly updated as clinical and scientific data had been accumulated [2].

The next section of the questionnaire included questions concerning the vaccination procedure. One of the most interesting issues concerns implementation of the basic principle of vaccination, namely — informing patients which is prescribed in normative documents [4, 17–19]. 100% of respondents answered this question. 96.0% clearly identified that informing patients about vaccines was one of their main tasks. At the same time, 91.0% noted they talked about the necessity of vaccination with their patients, 94.0% — about the consequences of refusing

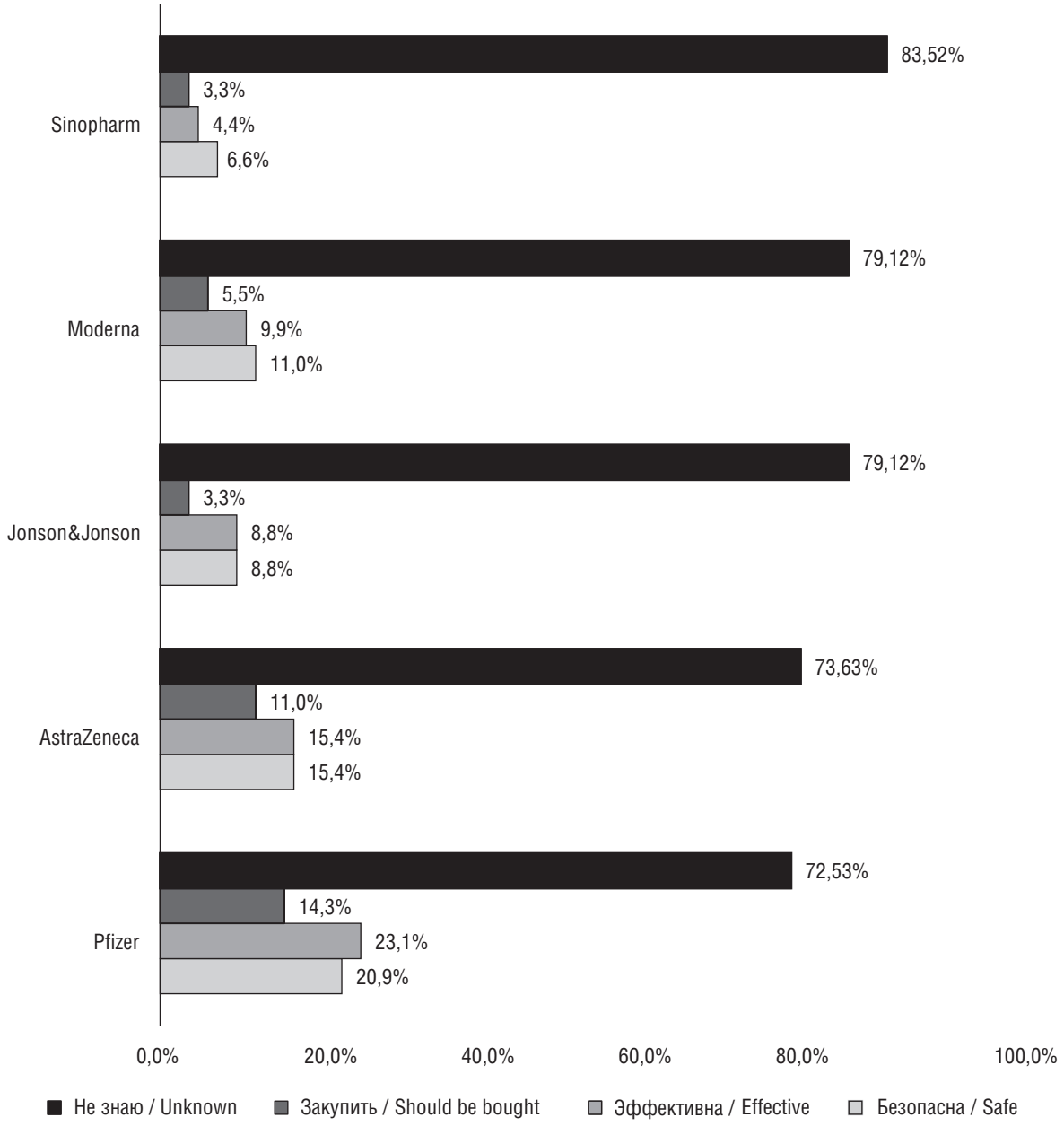

Fig. 5. The attitude of doctors towards foreign vaccines against COVID-19

Рис. 5. Отношение врачей к вакцинам против COVID-19 зарубежных производителей

vaccination, 94.0% — about post-vaccination phenomena, 87.0% — about vaccine safety, 83.0% informed the patient about the possibility of choosing a vaccine, 81.0% — about the possibility of choosing a medical facility outside the place of residence, 75.0% — about the possibility of choosing a doctor.

Physicians' arguments regarding the purpose of vaccination (Fig. 6) were as follows: 75.0% of general practitioners, 73.0% of pediatricians and 63.6% of other medical specialists suggested vaccination to prevent the spread of infection; respectively, 78.8% of general practitioners, 81.1% of pediatricians and 81.8% of other specialists suggested the vaccine to prevent the disease; 80.8% of general practitioners, 91.9% of pediatricians and 90.9% of other specialists recommended the vaccine as a guarantee of a milder course of the disease; 86.5% of general practitioners, 89.2% of pediatricians and 81.8% of other specialists suggested vaccination as a individual protection against COVID — 19%. 64.0% of all respondents considered this mission as their civil duty.

The results of the "complex" role of vaccination against COVID-19 should be understood on the basis of one of the most important and difficult tasks of health care systems in different countries. Namely, it is ensuring and stable maintenance of high coverage of the population with vaccinations against controllable infections. Public trust in vaccination is a priority factor in achieving this goal [8, 11].

In this regard, the following block of questions was extremely significant. It revealed doctors' opinions on reasons for patients' refusal of routine vaccination and vaccination against COVID-19, doctors' actions when patients refused to get vaccinated, as well as their attitudes towards some ethical issues.

The reasons for patients' refusals, according to physicians, were as follows (Fig. 7): 44.0% of respondents named fear of infection; 51.0% wrote that patients do not feel socially protected

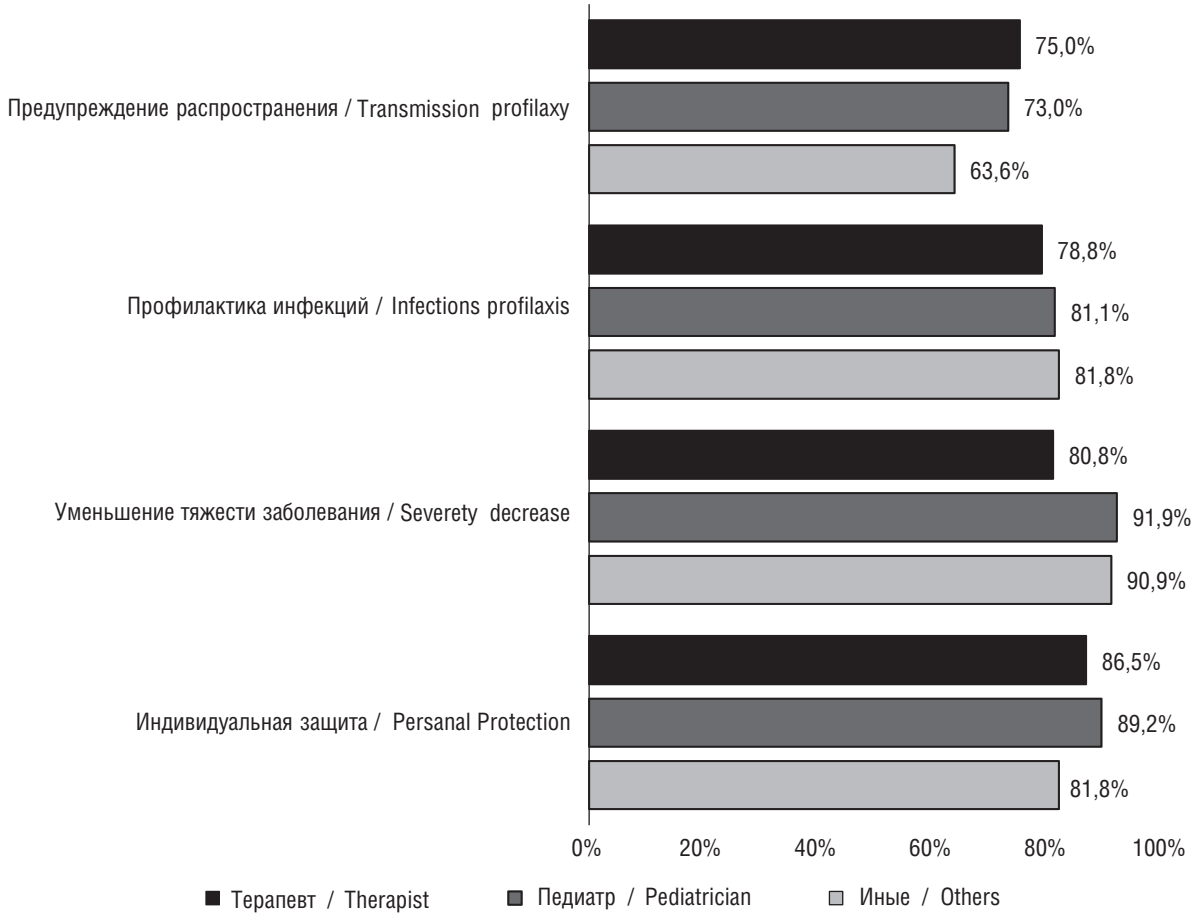

Fig. 6. Opinions of specialists in various fields about the leading arguments in justifying the need for vaccination

Рис. 6. Мнение специалистов различного профиля о ведущих аргументах при обосновании необходимости вакцинации

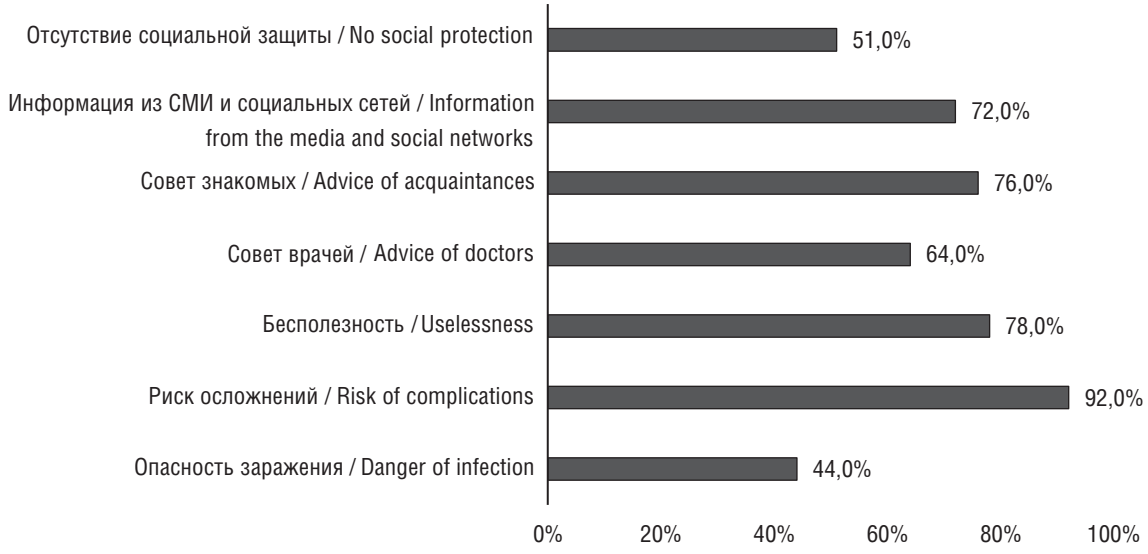

Fig. 7. The leading arguments for patients' refusal of routine vaccination according to respondents' opinion

Рис. 7. Ведущие аргументы отказа пациентов от рутинной вакцинации по мнению респондентов

in case of postvaccinal complications; 64.0% — that patients listen to doctors' advice; 72.0% believe that social networks and mass media play a leading role; 76.0% — that patients follow the advice of acquaintances and relatives; 78.0% are sure that patients consider vaccination useless; 92.0% — that patients are afraid of complications.

Analyzing the respondents' answers to the directly posed question: *"In your opinion, do parents protect or violate children's rights when refusing vaccination?"*, 80.0% of doctors, regardless of seniority and specialty, answered: "Parents violate children's rights". It should be noted that 89.2% of pediatricians think so.

The respondents determined the reasons for patients' unwillingness to vaccinate specifically against COVID-19 as follows: 42.0% mentioned fear of complications after vaccination; 87.0% indicated that patients thought vaccination was useless; 87.0% were sure that patients did not trust vaccine research and trials; 91.0% believed that there was very little information about vaccines; but most of all (94.0%) that the opinion of others had a great influence. This question was answered by 97.0% of respondents, and regardless of seniority and specialty, all doctors shared these assessments. The answers of respondents of different specialties and length of service are presented in Figure 8. In summary, it should be noted that during routine vaccination and vaccination against COVID-19, doctor' opinions about the reasons for patients' refusal to be vaccinated did not always coincide. Thus, in the case of COVID-19 vaccination, the respondents less frequently mentioned such a reason as the risk of complications, and more frequently mentioned the importance of other people's opinions about vaccines and the uselessness of vaccination. Respondents did not mention the risk of infection as an argument for patients' refusal to be vaccinated against COVID-19 at all.

Interestingly, the data of sociological surveys published in the central press indicated the same arguments for refusing vaccination, on the one hand, concerning the lack of open and objective data, and on the other hand, the abundance of incompetent and contradictory information in the popular press [9, 16, 32].

There has been a discussion in literature regarding actions that a physician should take when a patient refuses vaccination in general and in the case of COVID-19 vaccination in particular [30]. Our respondents were also questioned on this issue. 40.0% of physicians noted that when a patient refuses vaccination, they make a note in the relevant document and do not continue the conversation; 80.0% try to persuade patients by carefully explaining the risks; 62.0% also warn about sanctions, such as problems with travelling, visiting public places, and other. In general, respondents' answers indicate that not all doctors want to discuss vaccination with patients who initially refuse vaccination.

According to a number of authors, it may be caused by an imbalance between the difficulty of talking to the patient or his/her parents and the doctor's capabilities within the framework of routine practice, the patient's unwillingness to listen to a different opinion or information, and, what seems most important, the doctors' lack of communication skills in dealing with such patients. This problem has a systemic nature and requires consolidation of efforts of the state, civil society, and the medical community [25, 29].

The survey raised the question about the need for confidentiality of information about vaccination: *"Should and can doctors inform third parties about the fact that a particular person has not been vaccinated against a particular infection?"*. The respondents' opinions were equally divided: 50.0% believed that information about a patient's refusal to be vaccinated could be available to third parties, while the rest were in favour of confidentiality of such information. Unfortunately, they did not explain their answer.

On the one hand, this kind of information could become an instrument of discrimination against a person, on the other hand, the absence of this information in case of unwillingness or

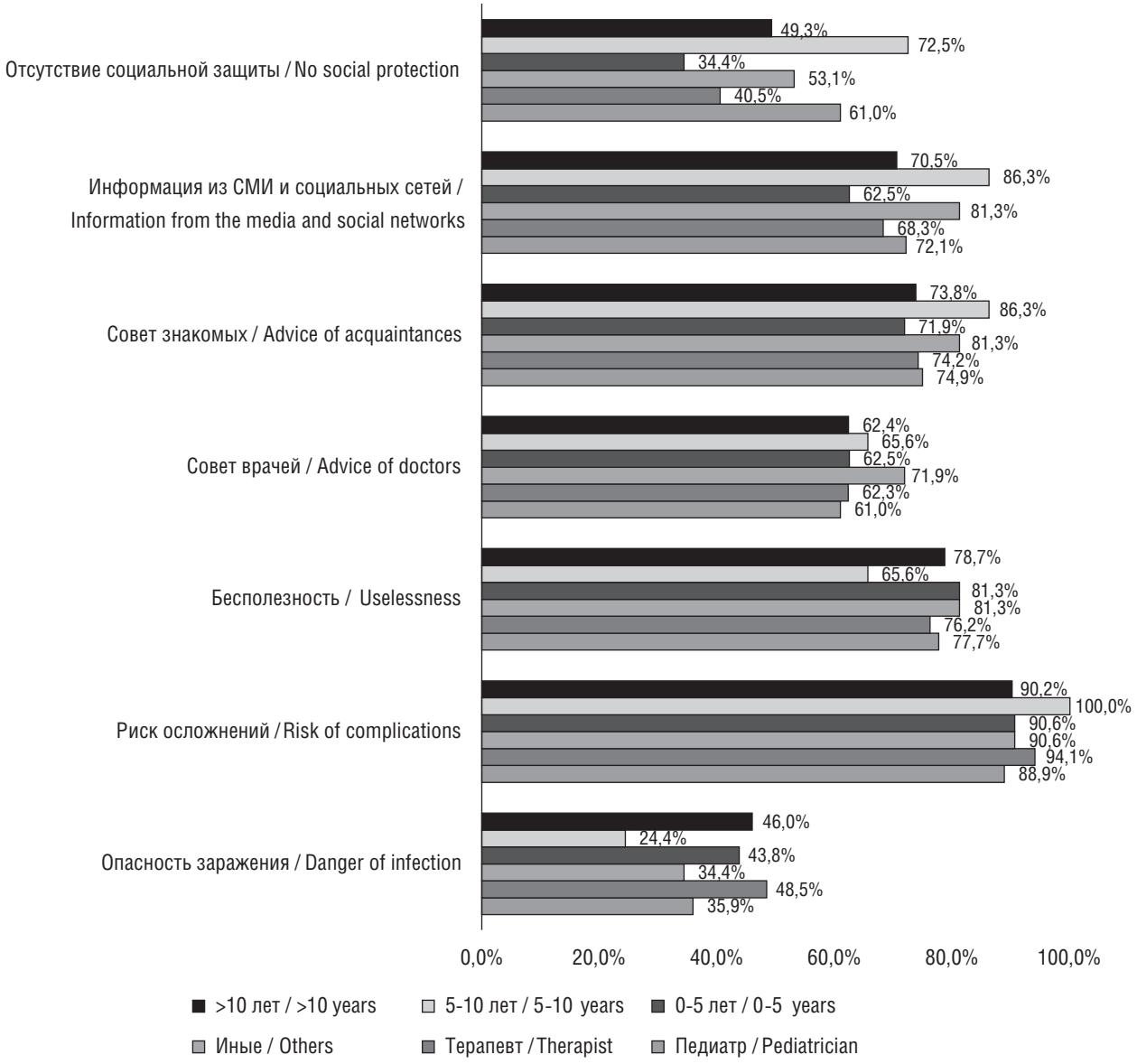

Fig. 8. The leading arguments for patients refusing vaccination against COVID-19 according to respondents of different specialties and work experience

Рис. 8. Ведущие аргументы отказа пациентов от вакцинации против COVID-19 по мнению респондентов разных специальностей и стажа работы

inability to report the fact of non-vaccination by a patient in certain conditions could carry a serious danger for other people and vulnerable groups.

Finally, respondents were asked: *"Is there a need for mandatory (compulsory) immunisation?"* Opinions were divided: 54.0% of respondents were in favour of introducing compulsory (forced) immunisation, while 46.0% of doctors were against, arguing that a person has freedom of choice. 49.0% of respondents considered it is necessary to forcefully vaccinate children, 12.0% among them explained their answer by the epidemiological significance of creating collective immunity. It is fairly stated in the case of the immunisation campaign against COVID-19 that compulsory vaccination was obscured by social and legal restrictions.

CONCLUSION

The results of the survey of physicians who were directly involved in vaccination prevention during the pandemic indicated that 77.0% of physicians who participated in the study were vaccinated against COVID-19, only 61.0% of them vaccinated voluntarily, and physicians with more experience were less committed to vaccination. The most significant factor that increased probability of refusal was low assessment of the quality of the administered drug and its immunogenicity. Only 56.0% of respondents expressed their opinion on how the basic principles of vaccination prevention organization are implemented in practice, namely: objective information of the population is provided, the principle of voluntariness is observed, and the effectiveness and safety of vaccination are monitored and recorded. 72.0% of respondents had the opportunity to choose a vaccine against COVID-19 when admitting a patient to vaccination, based on medical indications, the patient's desire and guided by compliance with the instructions for the drugs and clinical recommendations. According to the doctors' answers, when implementing the main principle of vaccination — informing patients, they informed them more about the necessity of vaccination, the consequences of refusing vaccination, post-vaccination phenomena, and less about the possibility of choosing a vaccine, medical institution, doctor, etc. More than 70% of physicians offered patients to be vaccinated against COVID-19 in order to prevent the spread of infection, to prevent the disease; as a guarantee of a lighter course of the disease, as a personal protection against infection. It is important that 64.0% of all respondents considered this mission as their civil duty.

Physicians' opinions concerning reasons for patients' refusal of routine vaccination and COVID-19 vaccination did not always coincide. Thus, when vaccinating against COVID-19, respondents indicated that patients considered vaccination useless, noted the lack of reliable information, and were mainly guided by the opinions of other people. Although 92.0% of respondents wrote that patients were afraid of complications during routine vaccination, this argument was not mentioned when patients refused vaccination against COVID-19. 54.0% of respondents supported the introduction of mandatory (compulsory) immunization, motivating the answer by the epidemiological significance of collective immunity. Those who were against (46.0%) argued that the individual had freedom of choice.

Consequently, the full context and results of our study, together with the materials of similar works, convincingly indicate the presence of a number of unresolved problems, primarily related to the necessity to increase the normative and humanitarian component of vaccination education and information programs. At the same time, the focus should be on legal and ethical long-term training of all professionals involved in the vaccination process. In addition, it is necessary to develop information sources with educational programs on vaccination and create open and qualified counseling resources to build trust and positive perception of vaccination, with a mandatory component of building feedback and dialogue with the community.

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.

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

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

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COMPLIENCE OF SCHOOLCHIDREN'S DIET WITH THE PRINCIPLES OF HEALTHY NUTRITION. THE ROLE OF EDUCATIONAL PROGRAMS

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ABSTRACT. Preserving and strengthening the health of children and adolescents turn out to be urgent problems in the modern world and a necessary condition for the existence and prosperity of the country. Non-communicable diseases (NCDs) are the main causes of the deterioration in the health status of the population. One of the predictors of NCDs is the increase in the number of overweight and obese children. Primary prevention is the most popular and effective measure to avoid the development of diseases. The issues of healthy nutrition such as the prevention of non-communicable diseases are in the focus of close attention not only of the medical community, but also of the state organs. National projects have been developed and are being successfully implemented in Russia. Teaching of the principles of a healthy lifestyle must be carried out from a child's very early age and the role of the family remains paramount, but it should not be neglected that most of the time the child spends within the walls of educational institutions. The purpose of our work was to survey adolescents to assess the level of knowledge about healthy nutrition and its application in everyday life alongside further training of the principles of healthy nutrition. Schoolchildren aged 10 to 17 years old living in various regions of the Russian Federation took part in the study on the basis of the FGBOU VDC "Orlyonok". A program developed presents 12 topics, combined into three content modules, and after the cause of training is completed, the children were asked to fill out a questionnaire. All children participating in the survey were trained and were engaged in the program "Fundamentals of Healthy Nutrition", the purpose of which is to develop adolescents' knowledge, skills and abilities in the field of healthy nutrition as a component of a healthy lifestyle. The program is authorized by the staff of the FGBOU VDC "Eaglet". The medical substantiation and scientific support of the program was provided by the staff of the Department of Pediatrics named after Academician A.F. Tur, St. Petersburg State Pediatric Medical University of the Ministry of Health of Russia. The program is implemented in the format of an optional practice-oriented course for children by Orlyonok teachers with the provision of advisory and methodological assistance by Rospotrebnadzor. Statistical processing of the obtained results was carried out using the Microsoft Excel software package. Thus, educational projects for schoolchildren, when teachers and pediatricians work together, represent a useful format for teaching children and adolescents a healthy lifestyle.

KEY WORDS: schoolchildren; rational nutrition; healthy lifestyle rules; NCDs.

СООТВЕТСТВИЕ РАЦИОНА ШКОЛЬНИКОВ ПРИНЦИПАМ ЗДОРОВОГО ПИТАНИЯ. РОЛЬ ОБРАЗОВАТЕЛЬНЫХ ПРОГРАММ

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РЕЗЮМЕ. Сохранение и укрепление здоровья детей и подростков являются актуальными проблемами в современном мире и необходимым условием для существования и процветания страны. Основными причинами ухудшения состояния здоровья населения являются неинфекционные заболевания (НИЗ). Один из предикторов НИЗ — рост числа детей с избыточным весом и ожирением. Первичная профилактика является наиболее востребованной и эффективной мерой предотвращения развития заболеваний. Вопросы здорового питания как профилактика неинфекционных заболеваний находятся в центре внимания не только медицинской общественности, но и государства. В России разработаны и успешно реализуются национальные проекты. Воспитание по принципам здорового образа жизни необходимо осуществлять с самого раннего возраста, и роль семьи остается первостепенной, но большую часть времени ребенок проводит в стенах образовательных учреждений. Целью нашей работы было анкетирование подростков для оценки уровня знаний о здоровом питании и применения их в повседневной жизни с дальнейшим обучением принципам здорового питания. В исследовании на базе ФГБОУ ВДЦ «Орлёнок» приняли участие школьники в возрасте от 10 до 17 лет, проживающие в различных регионах Российской Федерации. Была разработана программа, которая представляет 12 тем, объединенных в три содержательных модуля, и после обучения детям было предложено заполнить анкету. Все дети-участники анкетирования прошли обучение, занимались по программе «Основы здорового питания», целью которой является формирование у подростков знаний, умений и навыков в сфере здорового питания как составляющей здорового образа жизни. Автор программы — коллектив ФГБОУ ВДЦ «Орлёнок». Медицинское обоснование и научную поддержку программы оказал коллектив кафедры педиатрии им. акад. А.Ф. Тура СПбГПМУ Минздрава России. Программа реализуется в формате факультативного практико-ориентированного курса для детей педагогами «Орлёнка» при оказании консультативно-методической помощи Роспотребнадзором. Статистическую обработку полученных результатов проводили с использованием пакета программ Microsoft Excel. Таким образом, образовательные проекты для школьников при совместной работе педагогов и врачей-педиатров представляют полезный формат для обучения детей и подростков здоровому образу жизни.

КЛЮЧЕВЫЕ СЛОВА: школьники; рациональное питание; правила ЗОЖ; НИЗ.

INTRODUCTION

The most urgent task of modern medicine is to preserve and strengthen the health of pediatric population and improve the quality of life.

Nowadays, noncommunicable diseases (NCDs), which have a long course and are generally characterized by slow progression, are the leading causes of health deterioration and one of the main causes of death in economically developed countries. The international medical community focuses on 4 groups of NCDs including cardiovascular diseases (46% of NCD deaths), oncology (22%), chronic respiratory diseases (10%) and diabetes mellitus (4%) [17, 31]. World Health Organization (WHO) statistics report that NCDs were responsible for 40.5 million, or 71%, of global deaths in 2016. [17, 18]. These diseases were responsible for 75% of all deaths in the Russian Federation [20]. Although NCDs mainly affect adults, most of them have their origins in behaviors inculcated during childhood and adolescence.

A pressing global problem, in particular, remains the growing number of overweight and obese children, which in turn are predictors of the growth of NCDs. Over the past four decades, the number of obese children and adolescents has increased 10-fold globally. From 2014 to 2018, the incidence of obesity among children in the Russian Federation aged 0–17 years increased by 21.4%, with primary morbidity increasing by 8.7% [6]. Overweight and obesity persist in 50–60% of children in later life [29].

It is well known that human health depends on lifestyle by 50%; therefore, primary prevention aimed at avoiding diseases by eliminating or neutralizing causative and predisposing factors is the most popular and effective measure to prevent the development of NCDs [31].

Healthy nutrition is undoubtedly the most important factor in preventing NCDs, promoting health and increasing life expectancy. The issues of healthy nutrition are in the center of attention both in the medical community and in the state since it forms a healthy lifestyle and prevents non-communicable diseases [12]. The Russian Ministry of Health defines a healthy lifestyle as a way of life aimed at preventing the occurrence and development of non-communicable diseases and characterized by the exclusion or reduction of behavioral risk factors, which include tobacco use, harmful alcohol consumption, irrational nutrition, physical inactivity, and maladaptive coping with stress [17].

Much attention is paid to the promotion of healthy lifestyles and nutrition, particularly among children and adolescents all over the world. Developed and developing countries have established extensive state programs and activities at the school level. It is emphasized that successful work with children and adolescents in this direction is especially relevant and effective through the joint collaboration of pediatricians and teachers [25–28].

Russia actively cooperates with many countries of the world in the field of NCDs prevention and promotion of healthy lifestyles among children and adolescents. In particular, within the framework of BRICS, a council on physical culture and sport (BRICSCESS) has been established. The functions of BRICSCESS are aimed at performing various tasks such as establishing links between institutions and organizations; promoting cooperation in research, teaching and mentoring between scientists; developing, organizing and promoting conferences, seminars, workshops, symposia, round tables; publishing new scientific information related to physical activity, sports science, lifestyle management and nutrition [22].

Russian health care has a great experience in promoting and shaping a healthy lifestyle for children both at the state level and at the level of schools and holiday camps. The USSR schools carried out large-scale work on the formation of a proper lifestyle and commitment to healthy nutrition. Professor I.I. Milman, the founder of the system of hygienic education, started to develop health lessons as early as in the 1920s. In his opinion, it is the school teacher who is the main figure in the process of teaching all schoolchildren ‘the technique of performing hygienic skills’ [5]. The issues of proper nutrition were discussed at home economics and biology lessons, class hours and school events were held.

At present, the state policy in the sphere of protection and strengthening of children’s and adolescents’ health, as well as formation of a healthy lifestyle is implemented in accordance with the Decree N 240 29.05.2017 of the President of the Russian Federation V.V. Putin. Correspondingly, 2018–2027 was declared as the Decade of Childhood [14]. By the Order of the Government of the Russian Federation N 122-r dated 23 January 2021, there was ap-

proved the plan of main activities carried out within the framework of the Decade of Childhood for the period up to 2027. [10]. In accordance with this Plan, one of the main tasks was 'the formation of healthy lifestyle skills and family health culture as a basic value' [10].

A range of Russian national projects have been successfully developed and implemented, among them — "Demography", "Promoting a Healthy Lifestyle" and "Healthy Nutrition" programs. The "Strategy for the formation of a healthy lifestyle, prevention and control of non-infectious diseases for the period up to 2025" has been approved [6].

Upbringing according to the principles of healthy lifestyle is necessary for a child from a very early age, from these positions the role of the family remains paramount [29]. However, starting from preschool age, children spend most of their time in educational institutions. School is the most important institution of socialization for children and adolescents today; the foundations of individual health are formed during the period of school education, which constitute the health of society as a whole [16]. School age is an extremely important period when a child develops and the lifestyle is formed, so that many eating and physical activity habits are reinforced or established. School-age children have more freedom in their food choices; many eat at least once a day out-of-home [23]. Allowing them to participate in food choices at home and providing them with positive encouragement can help them make 'healthy' choices outside the home. School-aged children's attitudes towards food and food choices may be influenced (positively or negatively) by family members, friends and/or the media [27]. Appearance issues and societal attitudes towards obese people can influence the eating behavior and nutritional status of older children [24].

Parental influence still remains strong, but children communicate more with their peers and begin to make their own decisions about food choices, studies, and extra activities without direct parental supervision. At the same time, the time of food intake and its quality may not correspond to the physiological needs of a child. In adolescence, children may no longer find their favorite sports and hobbies interesting and replace them with sedentary activities or social networks.

Schools may offer effective opportunities to work on the development of healthy eating habits in children. That is why school and other educational institutions should become the most important link in the process of preserving and improving the health of students and promoting healthy lifestyles in general and healthy eating in particular.

However, despite the urgency of this task, and official recognition of its importance, issues of nutrition education still remain underdeveloped [2, 4]. Low awareness of teachers in educational institutions in relation to healthy lifestyle is one of main problems [19]. In addition, the material is presented in a boring or inaccessible form, and there is no personal example [21, 28], which also undermines confidence in the information. At the same time, pediatricians who have the necessary medical knowledge may not have the experience and ability to present this information to a large pediatric and/or adolescent audience. Thus, in modern conditions, the search for effective methods of forming healthy lifestyle attitudes in children and adolescents is relevant.

AIM

To assess the level of adolescents' knowledge about healthy eating and its use in everyday life by means of questionnaires. To teach schoolchildren the principles of healthy eating in a playful way.

MATERIALS AND METHODS

The study was conducted on the basis of the Federal State Budgetary Educational Institution All-Russian Children's Center "Orlyonok", director A.V. Dzheus, from October to December 2021 and involved 4267 children aged 10 to 17 years residing in different regions of the Russian Federation.

The staff of the Department of Paediatrics named after Academician A.F. Tur of the Federal State Budgetary Educational Institution of Higher Education "St. Petersburg State Pediatric Medical University" gave distance lectures for the teachers of RCC "Orlyonok". These lectures focused on rational nutrition, physical development and medical aspects of schoolchildren's movement regime as part of the joint project "Fundamentals of Healthy Nutrition" in March–May 2021.

The "Orlyonok" team developed a program under the general editorship of L.V. Spirina,

Deputy Director for Educational Activities, Personnel Management and Public Relations, and L.R. Sayfutdinova, Head of the Department of Educational Programs of RCC "Orlyonok", which presents 12 topics united in three content modules: 'Talking about health and proper nutrition', "Formula of proper nutrition", "Movement is life".

Children were asked to fill out a questionnaire after the sessions, which was compiled at the Department of Paediatrics named after Acad. A.F. Tur. The answers were anonymized and ethical committee permission to conduct the study was obtained.

Statistical processing of the obtained results was performed using Microsoft Excel software package.

RESULTS

A total of 4267 children (boys — 1845 (43%), girls — 2422 (57%)) responded to the questionnaire. The ages of the children ranged from 10 to 17 years, with the majority being 13 to 15 years old (Fig. 1).

Respondents lived in different regions of Russia, the largest number of children came to "Orlyonok" from the Central Federal District — 41.2%, 16% — from the Southern Federal District, from the Urals — 11.1%, from the North-West — 8.86%, from Siberia — 8.86%, from the Far East — 6.8%, from the Volga Region — 3.42%, from the Republic of Crimea — 0.3% and from other regions of Russia — 4.01% (Fig. 2). There was no significant difference in dietary intake depending on the region of residence and age of respondents.

Schoolchildren's breakfast should contain a sufficient amount of nutrients and calories to cover the upcoming energy expenditures. Breakfast should be dense and necessarily include a hot dish — cereal, cottage cheese, egg or meat [30]. The majority of schoolchildren preferred sandwiches (38%) and porridge (27%) for breakfast, more rarely children used eggs (11%), muesli (8%) and cottage cheese (8%) (Fig. 3).

The questionnaire survey revealed that 76% of children consumed meat daily or 3–4 times a week. Children who get meat 1–2 times a week accounted for 22%, and 2% of children do not eat meat (Fig. 4). The diet of school-aged children should include daily meat consumption, preferably of different varieties [6]. Consumption of meat 1–2 times a week or a complete refusal indicates a deficiency of animal protein and haem iron in almost a quarter of the children examined.

It is recommended that children should consume fish 2–3 times a week [6]. In our study 57% of children responded that they get fish in

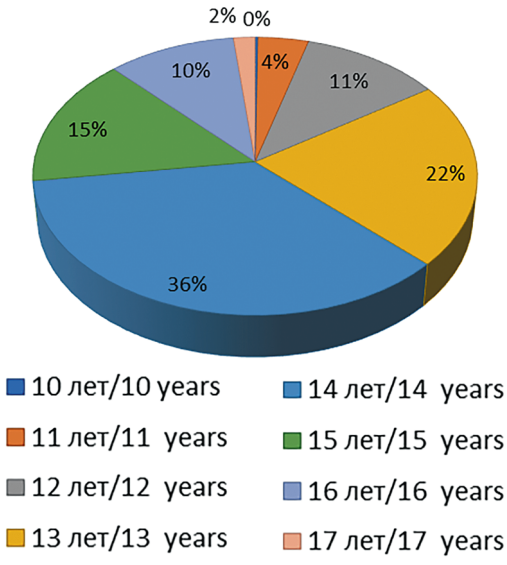

Fig. 1. Distribution of children by age

Рис. 1. Распределение детей по возрасту

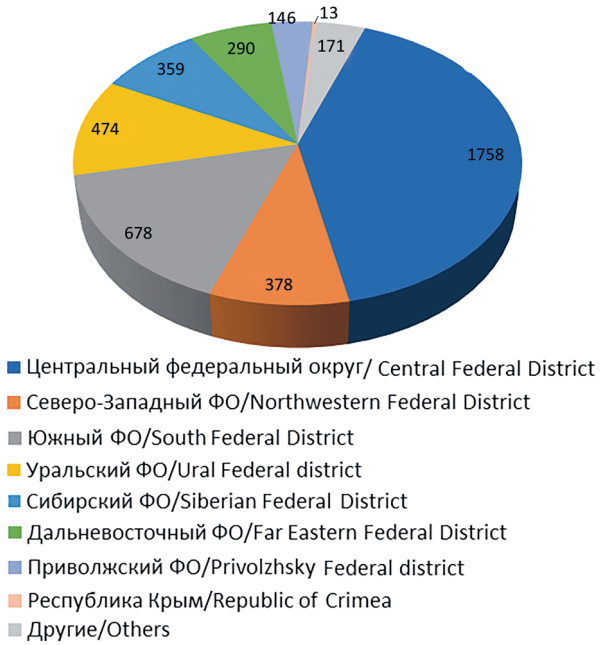

Fig. 2. Distribution of children by residential region: FD — Federal District

Рис. 2. Распределение детей по регионам проживания: ФО — федеральный округ

their diet 1–2 times a week, in 13% — 3–4 times a week, 26% do not eat fish (Fig. 5).

Overall, the percentage of fish consumption is quite high. However, a quarter of children do not eat fish, which is a source of easily digestible protein, polyunsaturated fatty acids, a number of vitamins and minerals.

Analyzing the questionnaires, it was established that 38% of children receive milk daily, 27% — 3–4 times a week, and 12% of children do not drink milk (Fig. 6). Milk protein and other components of milk meet the needs of children's organism to the maximum extent, and therefore it must be included in the diet and should not be substituted (in the absence of allergic reactions to cow's milk protein). The daily allowance of milk for school-age children is 500 ml [9].

Only 27% of children consume dairy products daily, 24% consume them 3–4 times a week, 40% consume them 1–2 times a week, and 9% do not consume dairy products (Fig. 7).

Consumption of fermented milk products in children is recommended in the amount of 200 ml of fermented milk drink, 60–70 g of cottage cheese, 10–20 g of sour cream and 10–15 g of cheese daily [3, 11]. Sour-milk products are sources of animal protein and also improve the intestinal microbiota.

Milk and dairy products are an indispensable source of calcium, it is difficult to meet the daily requirement for this important nutrient without sufficient intake.

Pasta and potatoes are consumed as a side dish to meat by 71% of children, and vegetables in stewed or raw form — by 15% (Fig. 8). The daily amount of carbohydrates in a child's diet should amount to 300–400 g, with no more than 100 g of simple carbohydrates, the bulk of which should be complex carbohydrates contained in cereals, legumes, and coarse bread [12].

Sufficient amounts of complex carbohydrates, which are the main sources of energy like simple carbohydrates, allow to avoid glucose spikes and utilize the energy gained rationally, since complex carbohydrates are digested slower. Potatoes are included in the list of complex carbohydrates, but their glycemic index is high and they are rapidly digested.

Schoolchildren in the study group have a significantly low consumption of vegetables, which should be present in daily diet as a source of vitamins and fibre [1]. Regular consumption of foods which are rich in soluble dietary

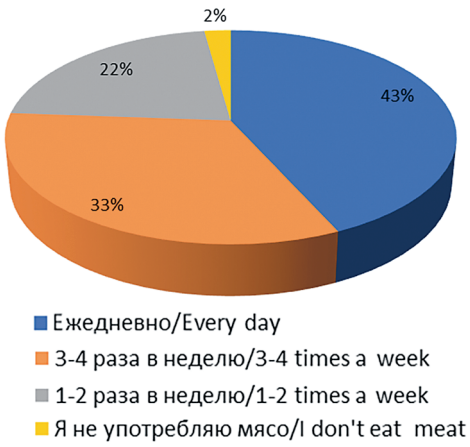

Fig. 4. Frequency of meat consumption per week

Рис. 4. Кратность употребления мяса в неделю

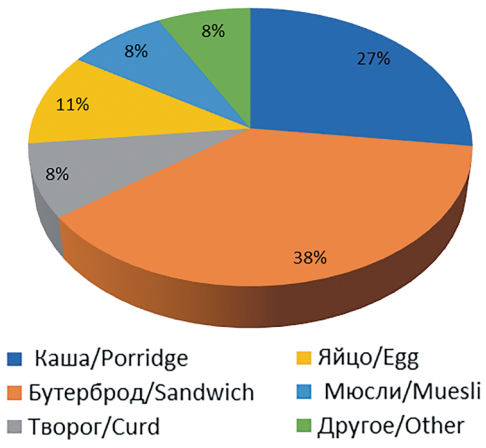

Fig. 3. Breakfast food preference

Рис. 3. Предпочтение продуктов на завтрак

Fig. 5. Frequency rate of fish consumption per week

Рис. 5. Кратность употребления рыбы в неделю

fiber reduces cholesterol levels, stabilises blood sugar and reduces fat absorption, which may reduce the risk of cardiovascular disease and circulatory disorders later in life. Soluble fiber is a prebiotic and is a substrate for the growth of beneficial microorganisms living in the colon [13].

According to the questionnaire survey data (Fig. 9), children consumed the following foods more than 3 times a week: potatoes, pasta and dumplings — 20%, fruits — 20%, bananas — 11%, candies — 16%, pastries and cakes — 17%, chips — 6%, nuts — 5%. Thus, only 31% of children regularly consume fruits. The rest of children consume high-carbohydrate foods frequently and in large quantities.

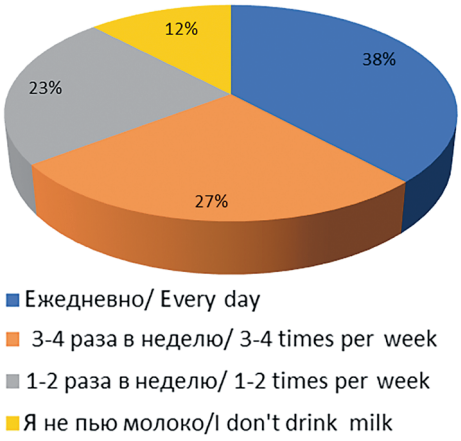

Fig. 6. Multiplicity of milk consumption

Рис. 6. Кратность употребления молока

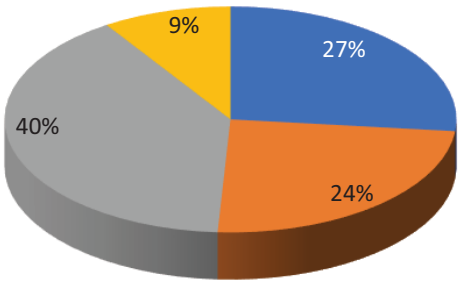

Fig. 7. The frequency of consumption of fermented milk products

Рис. 7. Кратность употребления кисломолочных продуктов

Children prefer tea or coffee with sugar — 40% or without sugar — 26%, juices — 13%, other drinks were used much less frequently (Fig. 10). The beverages recommended in children include: tea (preferably herbal or fruit), cocoa drink, and chicory-containing drinks [11]. Coffee consumption is undesirable on a daily basis.

Children more often consume fruit (30%), pastries (22%) or chocolate bars such as Snickers, Twix (18%) as a snack (Fig. 11). The use of products with a high level of added sugar (more than 38 g — not more than 10% of the daily requirement in carbohydrates), as

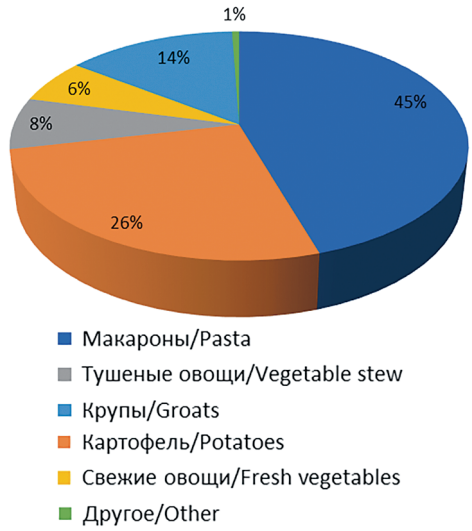

Fig. 8. Garnish for meat

Рис. 8. Гарнир к мясу

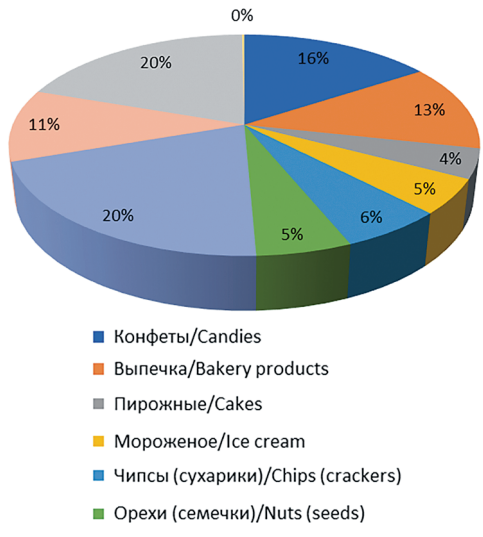

Fig. 9. Foods consumed more than 3 times a week

Рис. 9. Продукты, употребляемые более 3 раз в неделю

well as those containing cooking or confectionery fat, is not recommended in children's nutrition [15, 16].

According to the conducted questionnaire survey, 53% of children visit fast food restaurants not more than once a month, in 20% of cases — once a week, 16% of schoolchildren answered that they have never tried such food (Fig. 12).

All children who participated in the survey were trained in the "Basics of Healthy Eating" program. This program is based on the concept of creating educational programs on healthy nutrition in order to implement the National Project "Demography", part of the federal project "Forming a system of motivation for healthy lifestyles, including healthy eating and avoidance of bad habits (Strengthening Public Health)".

The goal of the "Basics of Healthy Eating" program was to provide adolescents with knowledge, skills and abilities in the area of healthy and safe eating as a component of a healthy lifestyle.

The implementation of the program makes it possible to achieve the following results:

1) the acquired knowledge allows adolescents to navigate in the assortment of the most typical food products, consciously choose the most useful ones;
2) adolescents are able to evaluate and control their diet and eating habits from the point of view of compliance with the requirements of a healthy lifestyle;
3) adolescents independently evaluate their diet from the point of view of its adequacy and conformity to their lifestyle;

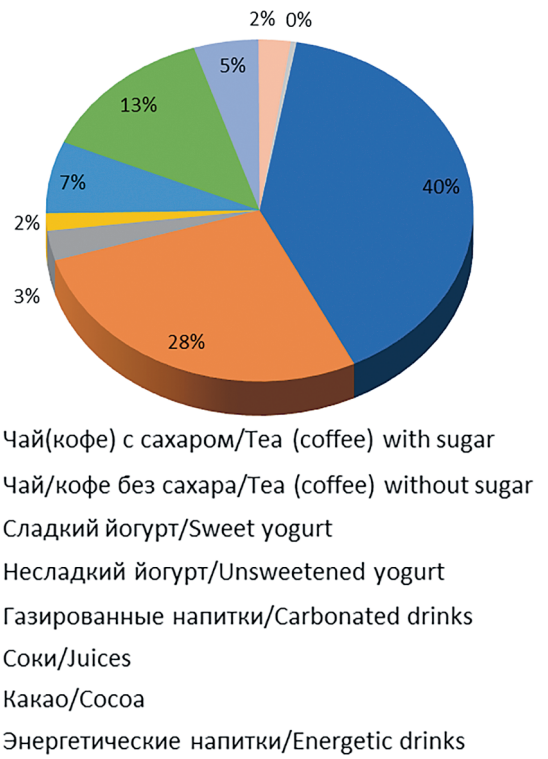

Fig. 10. Drinks consumed more than 3 times a week

Рис. 10. Напитки, употребляемые более 3 раз в неделю

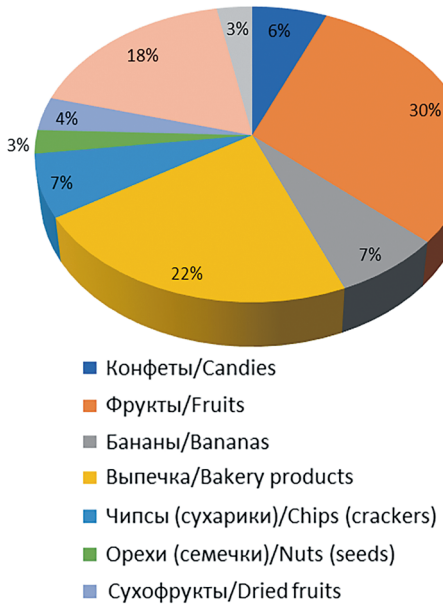

Fig. 11. Foods used as a snack

Рис. 11. Продукты, используемые в качестве перекуса

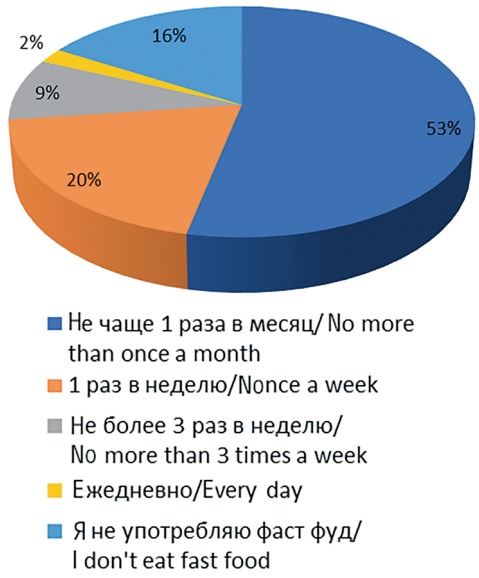

Fig. 12. Frequency of consumption fast food

Рис. 12. Частота употребления фастфуда

4) adolescents master various forms of motor activity in accordance with the loads they can bear.

The program is implemented as an optional practice-oriented course of additional development program for children's camps by educators, secondary school teachers, instructors in physical education, sports and tourism, methodologists, staff of the nutrition department and health protection department with the support and advisory and methodological assistance of Rospotrebnadzor.

The forms and methods used were interactive: heuristic classes, intellectual and creative games, culinary master classes, contests, presentations, discussions, motor activity classes, theatrical performances, etc. The program involves collective and independent work of adolescents, demonstration of the results of participation in practical activities.

The Program consisted of three modules. The first module "Talking about Health and Good Nutrition" was a series of games and interactive sessions, activities aimed at mastering different ways of motor activity. The second module was an educational internship on the basis of "Orlyonok" canteens. It included familiarization with the stages of cooking, studying the menu of the day and presenting it through various creative forms, tasting of Krasnodar tea with a story about its properties, preparation, growing area, master class on table setting. The third module — "Festival-Competition 'National Cuisine of Russia'" — consisted of educational platforms in the areas of "Culture and traditions of food of the peoples of Russia", "Technology and food", competition of culinary teams. The competition was implemented by specialists of the catering department, school, workshop of applied and artistic creativity, children's innovation center of aviation and astronautics, instructors for physical culture, sports and tourism.

The program's advantages are coverage of a large number of teenagers from different regions during the health recreation period, and work in teams.

According to the results of the questionnaire survey, the majority of children agreed (74%) that they learned a lot of new and beneficial things that will be useful in their future life, and 26% said that the classes did not add any new knowledge (Fig. 13).

After taking the classes, 39% of children said that they always knew and followed the rules of healthy lifestyle, but the majority of children (61%) promised to reconsider their diet and physical activity (Fig. 14).

CONCLUSION

Educational projects during recreation in children's health centers, joint work of teachers and pediatricians is a useful tool for the formation of a healthy lifestyle among adolescents.

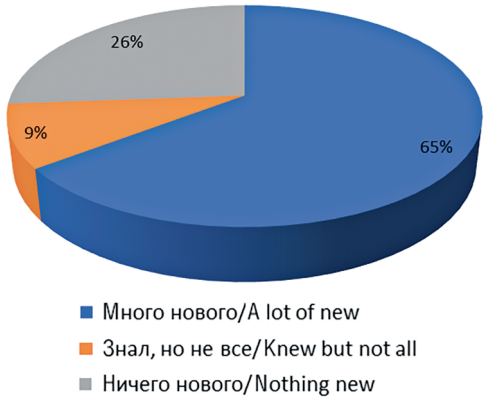

Fig. 13. Have you learnt anything new from the educational program?

Рис. 13. Узнал ли ты что-то новое из образовательной программы?

Fig. 14. Will you change anything in your diet and lifestyle when you leave the camp?

Рис. 14. Изменишь ли ты что-то в своем питании и образе жизни, когда вернешься из лагеря?

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.

Funding source. This study was not supported by any external sources of funding.

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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TO THE QUESTION OF ORGANIZATION OF OUTPATIENT ONCOLOGICAL CARE CENTERS FOR RESIDENTS OF THE LENINGRAD REGION

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ABSTRACT. According to the data provided by the World Health Organization, the number of detected cases of malignant neoplasms is steadily increasing. Deaths from malignant tumors are classified as "preventable", mainly due to prevention, early detection followed by high-quality dispensary observation. One of the ways to solve the problem of early diagnosis of malignant neoplasms is organization of outpatient cancer care centers. We have studied the statistical data of the Medical Information and Analytical Center of the Department of health of the Leningrad Region Administration and information from the publications of peer-reviewed journals for 2019–2022 topic research. As a result of the analyses of official statistical data and information from publications, measures are proposed to optimize the activities of the healthcare system and, in particular, regional centers for outpatient oncological care, to improve the quality of specialized oncological care for residents of the Leningrad Region. New approaches to the organization of medical care will help preserve the quality of life of patients and will reduce the mortality rate of the region's population from the increased number of malignant neoplasms.

KEY WORDS: malignant neoplasms; Leningrad Region; healthcare organization; diagnostics of malignant neoplasms; outpatient center for cancer care.

К ВОПРОСУ ОРГАНИЗАЦИИ ЦЕНТРОВ АМБУЛАТОРНОЙ ОНКОЛОГИЧЕСКОЙ ПОМОЩИ ЖИТЕЛЯМ ЛЕНИНГРАДСКОЙ ОБЛАСТИ

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РЕЗЮМЕ. По данным Всемирной организации здравоохранения, число вновь выявленных случаев злокачественных новообразований неуклонно растет. Смертельные случаи от злокачественных опухолей относятся к категории «предотвратимых», в основном за счет профилактики, раннего выявления и последующего качественного диспансерного наблюдения. Одним из вариантов решения вопроса ранней диагностики злокачественных новообразований признана организация центров амбулаторной онкологической помощи. Нами были изучены статистические данные Медицинского информационно-аналитического центра Комитета по здравоохранению Ленинградской области и сведения из публикаций рецензируемых журналов за 2019–2022 гг. по теме исследования. В результате изучения официальных статистических данных и сведений из публикаций предложены мероприятия по оптимизации деятельности системы здравоохранения и, в частности, региональных центров амбулаторной онкологической помощи, для повышения качества оказания специализированной онкологической помощи жителям Ленинградской области. Новые подходы в организации оказания медицинской помощи будут способствовать сохранению качества жизни пациентов и позволят снизить показатель смертности населения региона от развития ряда злокачественных новообразований.

КЛЮЧЕВЫЕ СЛОВА: злокачественные новообразования; Ленинградская область; организация здравоохранения; диагностика злокачественных новообразований; центр амбулаторной онкологической помощи.

According to the World Health Organization, 19.3 million new cases of malignant neoplasms (MN) will be detected worldwide in 2020, including 4.4 (22.8%) million cases in European countries [5]. According to the forecasts of the Medical Cancer Research Agency, by 2040 the number of newly detected cases of MN will reach 30.2 million (20-year increase +56.5%) [10].

Malignant tumors are included in the list of socially significant diseases in the Russian Federation (according to the RF Government Decree N 715 of 01.12.2004 "On Approval of the List of Socially Significant Diseases and the List of Diseases that pose a danger to others"), characterized by social and economic damage to patients in the form of disability and premature mortality [13]. According to the text of the Decree of the President of the Russian Federation from 21.07.2020 N 474 "On national development goals of the Russian Federation for the period up to 2030", the National project "Health Care" is currently being implemented [18]. In order to solve the task of "Increasing life expectancy to 78 years", the Decree of the President of the Russian Federation from 07.05.2018, N 204 "On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024" [17] was announced. It is planned to reduce the mortality rate from MN to 185.0 per 100 thousand people.

Pulmonary and bronchial MNs predominate in morbidity structure among the male population of developing countries, which is explained by smoking tobacco and its derivatives. In Western countries, prostate cancer is the leader [9]. The incidence of breast cancer in the female population is increasing all over the world [21, 22]. The change in attitude to reproductive age, participation in assisted reproductive technology programs, and other behavioral characteristics of young women are considered to be one of the main reasons for this increase. Despite the development of diagnostic equipment, high imaging capabilities of a number of MNs, and the availability of conditions for screening tumors of various localizations, the proportion of MNs detected in advanced stages, such as tumors of the organs of the female genital system, is still high in the Russian Federation [1].

According to official data, in 2019, 295.5 thousand cases of lethal outcomes from oncological diseases were registered (16.4% in the structure of mortality from all causes) [19]. Such deaths are categorized as "preventable": they can be prevented by primary (including the formation of a healthy lifestyle), secondary (early detection of diseases) or tertiary prevention (quality dispensary monito-

ring of patients who have undergone treatment). Sanitary and preventive measures and care about healthy lifestyle, which was much discussed in previous years, as well as the issues of increasing the notorious "cancer caution" of primary care physicians [6, 11], are insufficient to ensure the proper level of MN diagnostics [3].

The organization of outpatient oncological care centers (OOCC) is recognized as one of the solutions to the issue of early detection of MNs. According to the Order of the Ministry of Health of the Russian Federation N 48 dated 05.02.2019 "On Amendments to the procedure for providing medical care to the population in the profile "Oncology", approved by the Order of the Ministry of Health of the Russian Federation No. 915N dated 15.11.2012 [14], amendments were made to the procedure for providing medical care to the population in the profile "Oncology", which envisages an integrated multidisciplinary approach at the stage of primary specialized care for patients with MNs. In 2019, the subjects of the Russian Federation identified 532 medical centers to provide medical care to the population in the profile "oncology" within the framework of regional projects "Fighting cancer" [20]. These centers should serve as a model of primary specialized medical and sanitary care in 2019–2024. The activity of these centers is organized in accordance with the Rules given in Appendix No. 5 to the Procedure for the provision of medical care to the adult population for oncological diseases (approved by Order of the Ministry of Health of the Russian Federation from 19.02.2021, N 116n "On Approval of the Procedure for the provision of medical care to the adult population for oncological diseases" [16]) as well as

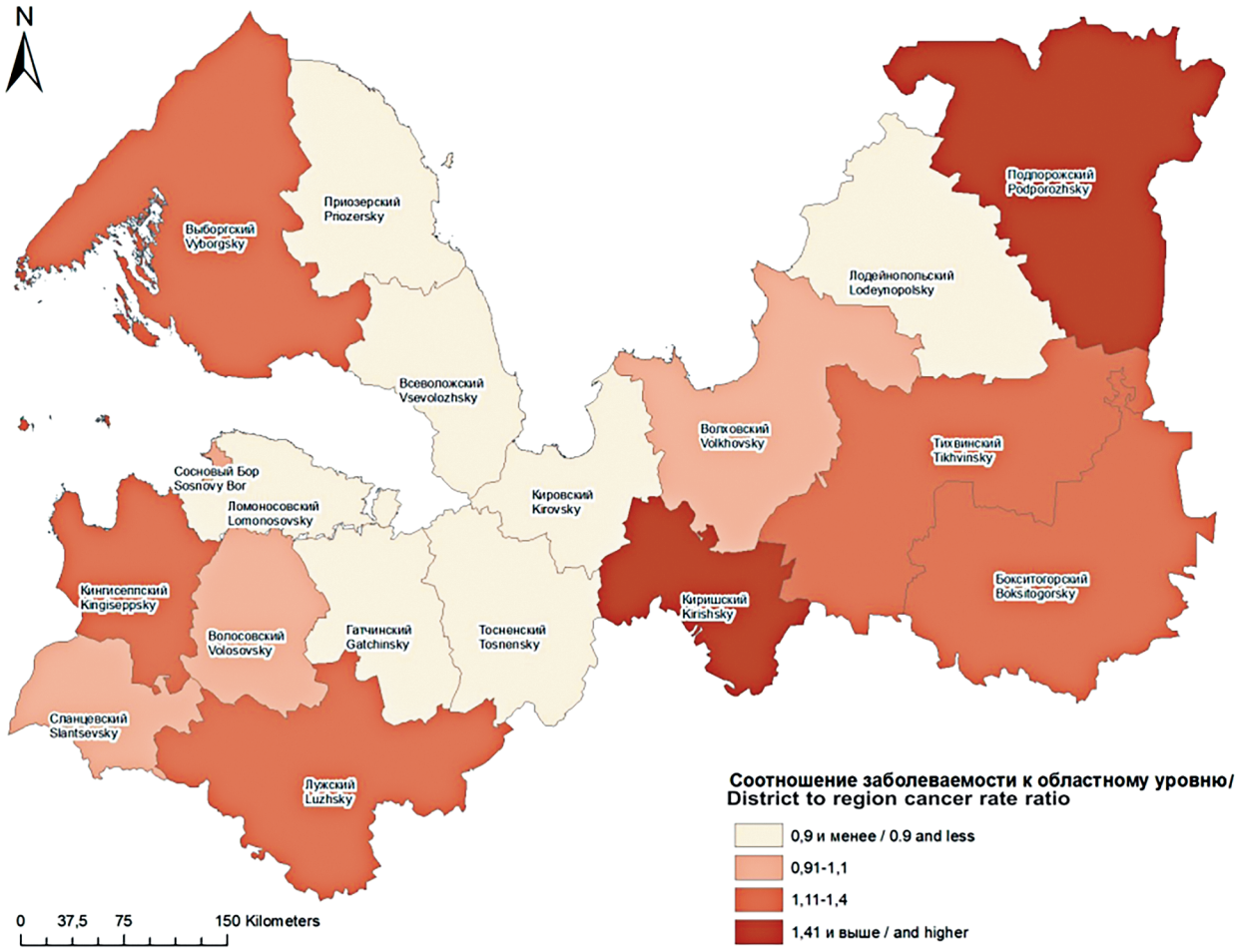

Fig. 1. Distribution of districts of the Leningrad Region according to the average (for 2008–2018) indicators of the primary incidence of malignant neoplasms in relation to the regional level [4]

Рис 1. Распределение районов Ленинградской области по усредненным (за 2008–2018 гг.) показателям первичной заболеваемости ЗНО в соотношении к областному уровню [4]

Table 1

Incidence rates of malignant neoplasms (per 100 thousand population) in the districts of the Leningrad Region in 2008–2018

Таблица 1

Показатели заболеваемости ЗНО (на 100 тыс. населения) в районах Ленинградской области в 2008–2018 гг.

Районы Ленинградской области / Districts of the Leningrad Region	Год / Year											Усредненное значение за 2008–2018 гг. / Average value for 2008–2018
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Бокситогорский / Boksitogorsky	389,4	424,3	386,9	277,4	290,8	307,6	356,2	283,0	423,6	370,9	443,8	359,5
Волосовский / Volosovsky	273,9	241,1	234,4	238,2	276,1	247,9	317,0	289,8	264,4	281,2	352,2	274,2
Волховский / Volkhovsky	282,4	301,2	280,5	263,3	262,1	263,3	345,3	283,2	321,7	351,7	408,1	305,7
Всеволожский / Vsevolozhsky	203,2	261,0	221,4	315,9	353,0	207,9	285,6	229,4	290,8	194,9	200,4	251,2
Выборгский / Vyborgsky	356,0	343,6	319,4	305,9	299,1	305,8	370,1	339,9	326,5	344,7	358,8	333,6
Гатчинский / Gatchina	240,5	199,0	232,6	224,7	235,6	195,3	277,0	285,1	273,6	304,9	420,9	262,7
Кингисеппский / Kingisepp	397,3	298,6	349,6	383,0	405,6	321,8	428,1	403,0	395,7	429,5	460,4	388,4
Киришский / Kirishi	**372,5**	**437,6**	**426,6**	**453,4**	**392,5**	**506,1**	**514,0**	**448,1**	**498,7**	**424,1**	**452,5**	**447,8**
Кировский / Kirovsky	228,9	256,5	260,2	257,2	236,6	221,6	260,8	240,4	391,0	200,8	214,8	251,7
Лодейнопольский / Lodeynopolsky	218,5	235,1	255,4	231,4	236,4	199,4	331,5	301,6	306,8	308,0	332,0	268,7
Ломоносовский / Lomonosovsky	235,5	333,7	284,4	258,0	236,1	247,4	291,5	253,8	252,7	251,9	231,0	261,5
Лужский / Luga	360,4	415,7	388,5	351,3	372,4	350,0	364,0	414,1	421,3	352,1	422,6	383,0
Подпорожский / Podporozhsky	**339,3**	**418,5**	**393,6**	**325,1**	**407,7**	**389,3**	**487,3**	**491,4**	**427,0**	**383,4**	**625,8**	**426,2**
Приозерский / Priozersky	365,8	234,0	254,5	234,4	218,6	269,2	240,3	128,5	327,5	120,9	327,4	247,4
Сланцевский / Slantsevsky	379,4	331,8	293,8	264,1	271,5	433,7	308,3	396,4	346,3	300,7	320,2	331,5
Тихвинский / Tikhvinsky	263,7	370,2	333,2	384,6	305,8	311,3	389,0	428,4	468,4	388,3	383,4	366,0
Тосненский / Tosnensky	285,7	255,2	312,4	217,6	225,3	263,0	291,7	273,8	177,7	266,0	235,8	254,9
Сосновый Бор / Sosnovyy Bor	193,1	207,5	288,8	260,2	237,4	294,2	241,5	329,4	285,5	335,1	370,5	276,7
Ленинградская область / Leningrad Region	**291,3**	**298,7**	**291,8**	**289,1**	**293,1**	**271,3**	**323,5**	**302,4**	**324,4**	**291,2**	**331,9**	**300,8**

methodological recommendations on the OOCC organization (approved by the Deputy Ministry of Health of the Russian Federation).

AIM

To determine the role of OOCC in early detection of MNs in the Leningrad Region (LR), Russia.

MATERIALS AND METHODS

Statistical data from the Medical Information and Analytical Center of the Health Care Committee of the Leningrad Oblast, as well as information from publications presented in refereed journals for 2019–2023 have been studied.

RESULTS

According to the Petrostat data, the mortality rate from MNs among the residents of the LR decreased slightly in 2019–2021: from 4156 to 3912 people, or from 224.9 to 207.7 people per 100 thousand population (–5.9%) [2]. A decline (–3.9 per cent) in the incidence rate of MNs (from 6886 to 4204 people, or from 369.8 to 221.0 per 100,000 population) was also registered. This is partly explained by the COVID-19 pandemic in 2020, which deteriorated the oncological registration of LR residents due to implementation of anti-epidemic measures.

Incidence rates of oncological diseases among LR residents have been studied. Therefore, "crude" indicators for 2008–2018 show that the most significant excess was observed in Kirishskiy and Podporozhsky districts (Fig. 1, Table 1) [4], which is associated not only with the quality and technical equipment of medical institutions, but also with the activities of harmful production enterprises located in these regions. The issue has been studied and the data published earlier [8].

In 2008–2018, the Podporozhsky and Kirishskiy districts of the LR registered high levels of standardized incidence rates of MNs (exceeding the LR average by 1.36 and 1.47 times, respectively), showing statistically significant differences ($p < 0.001$). The average level of the standardized incidence rate for the Russian Federation was also exceeded (1.1 and 1.19 times; $p=0.068$ and $p=0.001$, respectively) [19]. The unfavorable situation has remained by 2022: this indicator was 625.75 per 100,000 population in the Podporozhsky District, 460.78 in the Kingisepp District, and 451.52 in the Kirishsky District [12].

OOCCs are located in 5 districts of the Leningrad Region (5 beds in 4 districts, 3 beds in Kingisepp District). The staffing and location of OOCCs are presented in Table 2.

In 2019, Tikhvin was the first town in the Leningrad region which opened the OOCC. The center was based on the A.F. Kalmykov Interdistrict Hospital (IDH) (Table 2). The OOCC of the Vsevolozhsk District is characterized by the largest contingent of assigned population and staffing, the center is located on the basis of a regional oncological institution — the Leningrad Clinical Oncological Hospital named after L.D. Roman. The areas of OOCC location are schematically represented in Figure 2.

As follows from Figure 2, 4 out of 5 OOCCs are located in the western part of the Leningrad Region, providing outpatient medical care to 1,520,000 residents of the region (82.2%). There is 1 center in the eastern part of the region providing outpatient care to 330 thousand people (17.8%).

The Petrostat report shows that in 2019–2021, the number of medical outpatient organizations increased by 5.4% (from 300 to 317), which corresponds to the information concerning creation of OOCCs [2]. At the same time, the number of oncological profile beds decreased by 12.0%: from 482 to 424. The relative number of physicians and nursing staff in the region remained almost the same: the number of nursing staff is decreasing, but unreliably (Fig. 3).

The creation of OOCCs in LR allowed to improve the availability of specialized medical care for patients with MNs by organizing courses of chemotherapeutic (adjuvant and neoadjuvant) treatment. Creation of OOCCs in Leningrad Region made it possible to improve the availability of specialized medical care for patients with MNs by organising courses of chemotherapeutic (adjuvant and neoadjuvant) treatment. In 2019–2023, Tikhvin OOCC provided chemotherapeutic treatment to 1092 patients, Vyborg — 601 patients, Gatchina — 1193 patients, Kingisepp — 647 patients. This type of care was possible due to staffing with medical oncologists and constant consultative telecommunication with the staff of the head regional

Table 2

General data about the activities of the OCC of the Leningrad Region

Таблица 2

Общие сведения о деятельности ЦАОП Ленинградской области

Район / Area	**Место расположения / Location**	**Год начала работы / Starting year**	**Контингент приписного населения, тыс. чел. / The contingent of the registered population, thousand people**	**Кадровый состав / Personnel composition**
Выборгский / Vyborgsky	Выборгская МРБ*. г. Выборг, ул. Октябрьская, д. 2 / Vyborg MRB*. Vyborg, st. Oktyabrskaya, 2	2020	260	1) Заведующий ЦАОП, врач-онколог / Head of CAOP, oncologist; 2) врач-онколог / oncologist; 3) врач-онколог / oncologist; 4) врач-эндоскопист / endoscopist
Гатчинский / Gatchina	Гатчинская клиническая МРБ. г. Гатчина, ул. Урицкого, д. 1 / Gatchina clinical IH. Gatchina, st. Uritsky, d. 1	2020	495	1) Заведующий ЦАОП, врач-онколог / Head of CAOP, oncologist; 2) врач-онколог/ oncologist; 3) врач-онколог/ oncologist; 4) врач-эндоскопист / endoscopist
Всеволожский / Vsevolozhsky	Ленинградский клинический онкологический диспансер им. Л.Д. Романа. Всеволожский район, пос. Кузьмоловский, ул. Заозерная, д. 2 / Leningrad Clinical Oncological Dispensary named after L.D. Roman. Vsevolozhsk district, pos. Kuzmolovsky, st. Zaozernaya, 2	2020	505	1) Заведующий ЦАОП, врач-онколог / Head of CAOP, oncologist; 2) врач-онколог (уролог) / oncourologist; 3) врач-онколог (торакальный хирург) / thoracic surgeon; 4) врач-онколог (маммолог) / mammologist 5) врач-онколог (специалист голова-шея) / oncologist specialist head-neck
Тихвинский / Tikhvinsky	Тихвинская МРБ им. А.Ф. Калмыкова. г. Тихвин, ул. Карла Маркса, д. 66 / Tikhvin IH named after A.F. Kalmykov. Tikhvin, st. Karl Marx, 66	2019	330	1) Заведующий ЦАОП, врач-онколог / Head of CAOP, oncologist; 2) врач-онколог / oncologist; 3) врач-онколог / oncologist; 4) врач-эндоскопист/ endoscopist
Кингисеппский / Kingisepp	Кингисеппская МРБ им. П.Н. Прохорова. г. Кингисепп, ул. Воровского, д. 20 / Kingisepp IH named after P.N. Prokhorov. Kingisepp, st. Vorovskogo, 20	2020	260	1) Заведующий ЦАОП, врач-онколог / Head of CAOP, oncologist; 2) врач-онколог/ oncologist; 3) врач-эндоскопист/ endoscopist

* МРБ — межрайонная больница / IH — interdistrict hospital.

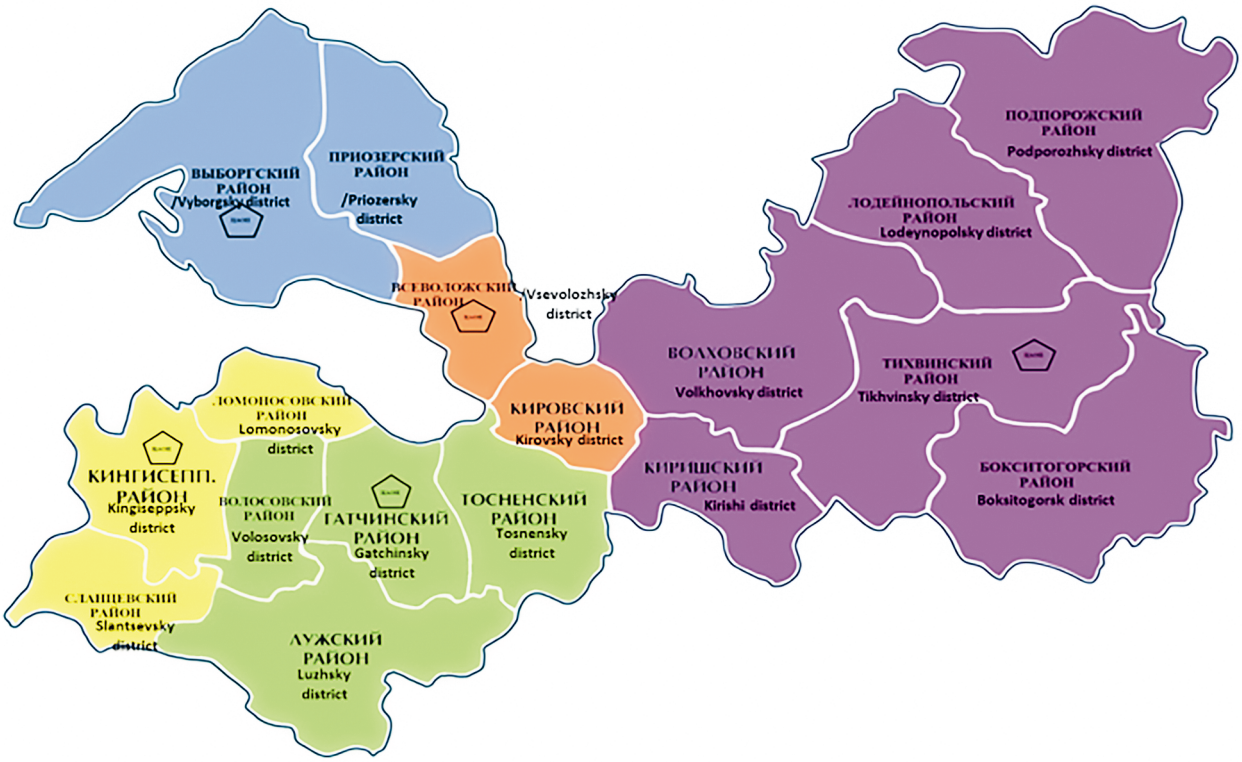

Fig. 2. Schematic distribution of OCC in the districts of the Leningrad Region

Рис. 2. Схематическое распределение ЦАОП в районах Ленинградской области

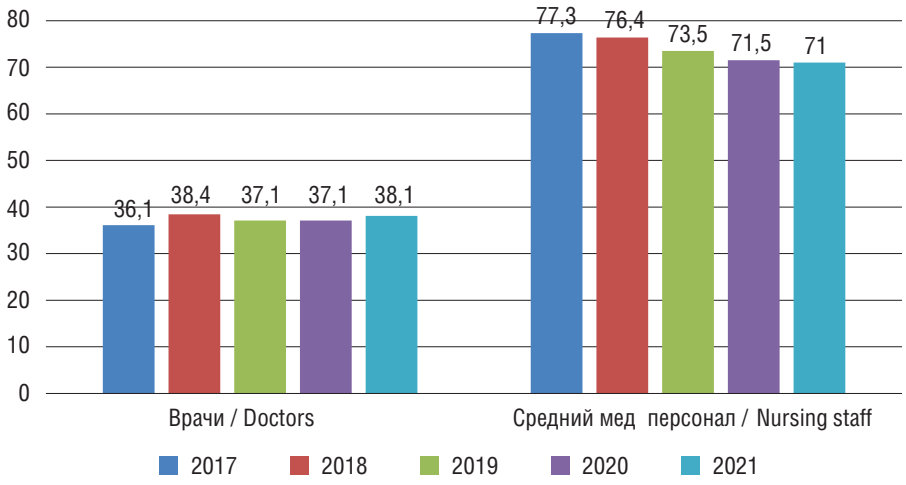

Fig. 3. The number of doctors and nurses in healthcare facilities in the Leningrad Region for 2017–2021

Рис. 3. Численность врачей и среднего медицинского персонала в учреждениях здравоохранения Ленинградской области за 2017–2021 гг.

institution of Leningrad Oblast — the State Budgetary Institution LOCOD.

DISCUSSION

Since 1 January 2022, the Order of the Ministry of Health of the Russian Federation from 15.11.2012 N 915n 'On Approval of the Procedure for the provision of medical care to the population in the profile of "oncology"' is no longer in force [15], but the Order of the Ministry of Health of the Russian Federation from 19.02.2021 N 116n 'On Approval of the Procedure for the provision of medical care to

the adult population in cancer' is relevant at the moment [16]. The order includes Appendix N 5, which sets out the basic requirements for the organization of OOCC. According to the methodological recommendations in relation to OOCCs which are located in the constituent subjects of the Russian Federation (approved by the Ministry of Health of the Russian Federation on 16.08.2021) [7], the goals of OOCC are to provide RF residents with MNs with high-quality and affordable primary specialized medical care: to establish the diagnosis of MNs and its stage within the timeframe defined by the state guarantee program.

As a result of the OOCC organization, it is expected to improve the territorial and transport accessibility of specialized medical care for patients with MNs [7]. In order to justify the necessity in a certain OOCC, climatic and geographical features of an area, transport accessibility, population density of a district and peculiarities of the material and technical base of medical centers are taken into account.

In recent years, oncological morbidity in LR has been increasing among residents of the eastern territories of the region, where 1 OOCC is located (in Tikhvin). Without analyzing the reasons for the growth of this indicator (this issue will be discussed in our subsequent publications), it is necessary to state that transport accessibility for diagnostics and treatment of MNs in the population of the eastern districts is as difficult as in the western districts.

Despite of increasing incidence rate of MNS among the residents of the Kingisepp district, citizens could specifically address the staff of the Kingisepp IDH. In contrast, residents of other LR districts (Podporozhsky and Kirishsky), which are unfavourable in terms of oncological statistics, apply to the neighbouring OOCC (in Tikhvin town). Alternatively, they are referred by a physician of their local health care center to the OOCC of the Vsevolozhsky district (polyclinic of the LOCOD hospital), where the inpatient base of the head oncological institution in the region is located.

CONCLUSION

Optimisation of the health care system continues, so the number of beds for providing specialized oncological care to the residents of LR decreases. Moreover, qualification of medical staff at IDHs of the region is insufficient, and this situation requires certain administrative and organizational solutions. It is necessary to review the staffing structure of medical centers in the eastern districts of the Leningrad Oblast, with additional training of medical and nursing staff. Material and technical base of treatment facilities of Podporozhsky and Kirishi districts should be examined and, if necessary, reformed in order to ensure early diagnosis of miligant turmors among the residents of these territories. As a result, territorial measures can be taken to reorganise a number of primary oncological offices and transfer them to the status of OOCCs, with further optimisation of their structure and staffing of outpatient departments. One of the options may be the organization of OOCC in Volkhov IDH, since the hospital is located at the intersection of transport routes of the region.

As a result, these measures will contribute to preserving the patients' quality of life, reduce the MN mortality rate (in accordance with the National Project) and raise the status of the oncological service in the region.

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

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STAFFING OF THE CLINICAL LABORATORY SERVICE OF SAINT PETERSBURG IN PRIMARY HEALTH CARE DELIVERY

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ABSTRACT. The growing importance of laboratory diagnostics in the primary health care delivery increases requirements regarding the staffing of the clinical laboratory service and determines the need for its examination. An analysis of the staffing of the clinical laboratory service in Saint Petersburg in primary health care delivery demonstrated that it largely corresponds to all-Russian and global trends, such as the predominance of mid-level professionals in the structure, reduction in the number of laboratory physicians and mid-level laboratory professionals, and a shortage of medical technologists. In general, the development of the personnel potential of the clinical laboratory service in primary health care delivery of Saint Petersburg in 2016–2021 can be considered favorable due to the increase in the staffing level of full-time rates of laboratory physicians and mid-level health professionals, raise in the number of positions and staff, as well as the staffing level of higher education (non-medical) professionals and a reduction in the part-time rate among laboratory physicians. At the same time, there is one of the lowest ratios of laboratory physicians and mid-level health professionals among the Russian regions, which requires the adoption of organizational measures to train mid-level laboratory professionals. An increase in the staffing level of higher education (non-medical) professionals is important for organizing high-tech research, which is significant in the context of the transformation to value-based healthcare and the laboratory monitoring of patients with chronic diseases.

KEY WORDS: personnel; clinical laboratory diagnostics; primary health care; staffing; provision.

КАДРОВОЕ ОБЕСПЕЧЕНИЕ СЛУЖБЫ КЛИНИЧЕСКОЙ ЛАБОРАТОРНОЙ ДИАГНОСТИКИ САНКТ-ПЕТЕРБУРГА ПРИ ОКАЗАНИИ ПЕРВИЧНОЙ МЕДИКО-САНИТАРНОЙ ПОМОЩИ

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РЕЗЮМЕ. Возрастающая значимость лабораторных данных при оказании первичной медико-санитарной помощи предъявляет повышенные требования к кадровому обеспечению лабораторной службы и определяет необходимость его изучения. Анализ кадрового состава службы клинической лабораторной диагностики Санкт-Петербурга показал, что обеспечение специалистами при оказании первичной медико-санитарной помощи во многом соответствует общероссийским и мировым тенденциям, таким как преобладание в структуре среднего медицинского персонала, сокращение числа врачей и среднего медицинского персонала, дефицит медицинских технологов. В целом развитие кадрового потенциала службы клинической лабораторной диагностики Санкт-Петербурга при оказании первичной медико-санитарной помощи в 2016–2021 гг. можно считать благоприятным за счет роста укомплектованности штатных врачебных ставок и ставок среднего медицинского персонала физическими лицами, увеличения числа должностей и физических лиц, а также укомплектованности должностей специалистов с высшим немедицинским образованием и сокращения коэффициента совместительства среди врачей клинической лабораторной диагностики. Вместе с тем в кадровой структуре обращает на себя внимание одно из самых низких среди регионов соотношение врачей и среднего медицинского персонала, что требует принятия организационных мер по подготовке специалистов лабораторной службы со средним медицинским образованием. Рост укомплектованности должностей специалистов с высшим немедицинским образованием является важным с точки зрения организации высокотехнологичных исследований, значимых в условиях формирования ценностно-ориентированной системы здравоохранения и обеспечения лабораторного мониторинга больных с хроническими заболеваниями.

КЛЮЧЕВЫЕ СЛОВА: кадры; клиническая лабораторная диагностика; первичная медико-санитарная помощь; укомплектованность; обеспеченность.

Importance of laboratory diagnostics in primary health care (PHC) in the context of value-based healthcare increases, which leads to changes in the role of medical laboratory specialists in the treatment and diagnostic process [23].

Laboratory specialists were considered to be responsible only for the qualitative performance of tests prescribed by physicians for a long time. Thier participation in diagnostic processes was often regarded as interference in the professional activities of clinical practitioners [2]. Recent studies have shown that active development and introduction of the latest laboratory technologies often creates uncertainty among primary care physicians in relation to ordering and interpretation of laboratory results [24], and requires timely assistance from laboratory professionals [1]. In this regard, laboratory personnel become an equal participant in clinical diagnostic processes. Completeness and speed of patient examination, diagnosis and laboratory monitoring in the course of treatment significantly depend on laboratory specialists.

AIM

To analyze the staffing of the clinical laboratory diagnostic services (CLDS) of St. Petersburg in the course of primary health care.

MATERIALS AND METHODS

The study was conducted on the basis of the Federal State Budgetary Educational Institution of Higher Education “Pavlov First Saint Petersburg State Medical University” of the Ministry of Health of the Russian Federation.

Data on staffing were obtained by analyzing tables 1100 “Positions and individuals of a medical organization” of federal statistical observation forms N 30 “Information about a medical organization” (for the positions (specialties) “Clinical Laboratory Diagnostics”, “Laboratory Doctor”, “Biologist”, “Expert Chemist”, “Laboratory Technician”, “Medical Laboratory Technician”, “Medical Technologist”). The tables were provided by the St. Petersburg Medical Information and Analytical Center (forms approved by Rosstat [15–19]), for St. Petersburg as a whole and in the context of Interdistrict Centralized Clinical and Diagnostic Laboratories (ICCDL), which ensure that 85% of tests are performed in outpatient settings [6].

Data on the resident population of St. Petersburg were obtained from the statistical yearbook of the Department of the Federal State Statistics Service for St. Petersburg and the Leningrad Region [8].

In order to analyze the staffing, the structure and a number of specialists of the clinical laboratory diagnostics service were assessed. Indicators of staffing with medical personnel were calculated as well (staffing of full-time positions and the compatibility coefficient). There have been performed the assessment of provision of the population with laboratory staff. The ratio of CLD doctors and nursing staff for 2016–2021 was determined.

Generally accepted formulas were used to calculate the indicators of coverage with CLD specialists [5, 10, 12].

Database creation, analysis and statistical processing of the results were carried out by using Microsoft Office Excel.

RESULTS AND DISCUSSION

Studying the staff composition of the clinical laboratory diagnostics service of St. Petersburg showed that the number of employees in the units providing medical care in outpatient settings has a steady downward trend. Over the period 2016–2021, the total number of main employees in occupied positions decreased by 12.5% (Fig. 1). At the same time, the number of individuals of CLD physicians decreased by 9.6%, specialists with secondary medical education — by 15.7%, while the number of specialists with higher non-medical education increased by 20% over the same period.

Nursing staff (63.0–65.5% during 2016–2021) dominates among all specialists of the service, which corresponds to the world and national standards. According to recommended staffing standards of a clinical diagnostic laboratory (department, division), there should be at least three positions of nursing staff per one position of a doctor (biologist/laboratory physician/expert chemist) [11]. In addition, the requirements of the professional standard assign this group of specialists to perform the most mass and frequently prescribed laboratory diagnostic tests (tests of the first and second categories of complexity) [14].

The wide range of duties assigned to the nursing staff of clinical diagnostic laboratories requires the necessary number of such workers, which can be determined by the staffing coverage level. In 2017–2020, laboratory coverage with nursing staff in outpatient units increased and ranged from 81.9–83.8% (employed rates) and 49.4–56.2% (individuals), respectively

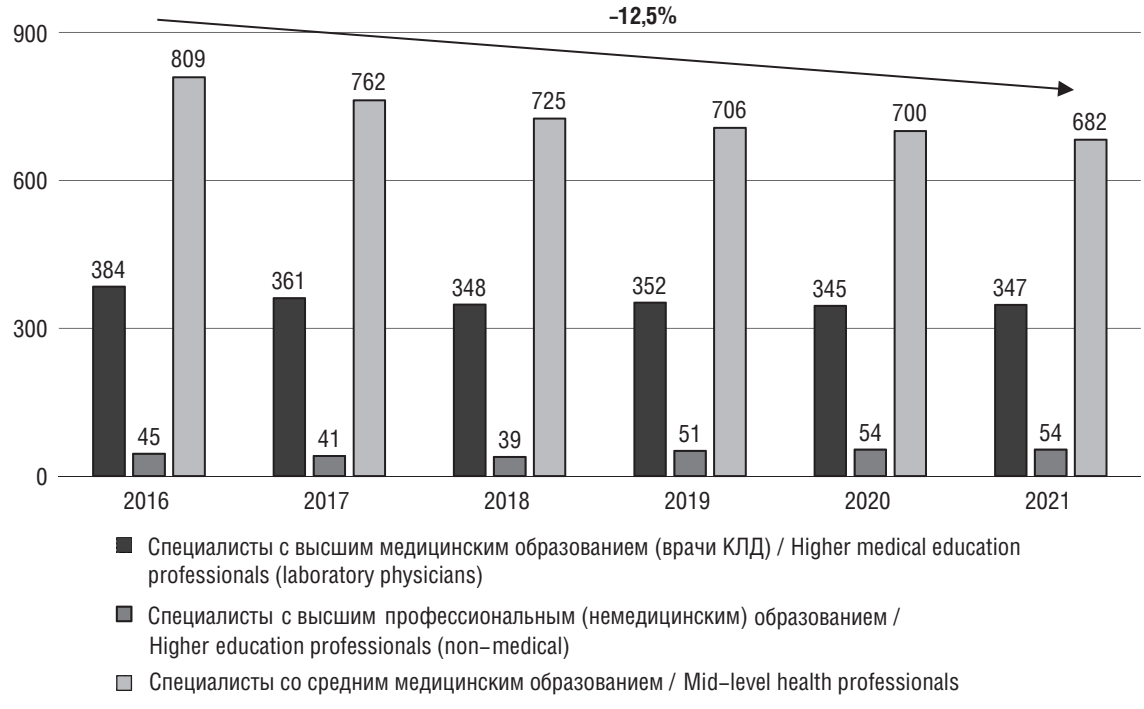

Fig. 1. Dynamics of the personnel structure of the clinical laboratory service in Saint-Petersburg in outpatient settings

Рис. 1. Динамика кадрового состава службы клинической лабораторной диагностики Санкт-Петербурга в подразделениях, оказывающих медицинскую помощь в амбулаторных условиях

(Table 1). In 2021, there was a decrease in the staffing ratios for both employed rates and individuals by 6 and 7.1%, respectively, as compared to the previous year, due to a decrease in employed rates (by 1.4%) and individuals (by 2.6%) against an increase in the number of staff positions (by 4.9%). Thus, in 2021, an outflow of nursing staff was observed due to the spread of coronavirus infection (COVID-19), and therefore, workload of laboratory staff increased.

Nursing coverage is largely achieved due to compatibility. The average value of the indicator for the Russian Federation is 1.33–1.39 [4, 20]. St. Petersburg shows a fairly high level of compatibility, which in 2016–2021 varied in the range of 1.5–1.7. The compatibility rate was even higher in the context of individual positions: 1.8 — for laboratory technicians and medical technologists in 2021. At the same time, the staffing of laboratory technicians steadily decreased. In 2021 the coverage with nursing staff reached the lowest rate (58.5% of occupied positions). The high coefficient of compatibility among medical technologists allowed to ensure high staffing levels (95.5% in 2021), nevertheless, their share in the structure of the average medical staff of the laboratory service traditionally remains the lowest, and the issue of training nationwide is the most acute [21].

Interdistrict Centralized Clinical and Diagnostics Laboratory (ICCDL) of St. Petersburg showed higher level of nursing coverage in comparison with the city average (83.4–91.4% in 2016–2021), however, it was also largely achieved due to part-time staffing (1.89 in 2021).

The high compatibility rate and inadequate nursing coverage results in a high workload for nursing staff, which can have negative consequences for the quality of medical laboratory services and their availability in РНС ПМСП. In such circumstances, the workload is often redistributed to workers with higher qualifications, primarily physicians.

An analysis of human resource potential of doctors in the clinical laboratory diagnostics service showed a decrease in the number of full-time positions of CLD doctors — from 784.8 in 2016 to 618.0 in 2021. (visibility indicator — 78.75%, rate of decline — 21.25%), including employed positions — from 658 to 490 (visibility indicator — 74.5%, rate of decline — 25.5%), and individuals — from 384 in 2016 to 347 in 2021 (visibility indicator — 90.4%, rate of decline — 9.6%). At the same time, in 2021, after a four-year decline, the number of full-time posts of doctors as well as nursing staff increased by 1.3%, which may be associated with the spread of a new coronavirus infection (COVID-19), since the laboratory service plays a significant role in its detection. At the same time, the increase in the number of full-time jobs did not lead to expected growth in the

Table 1

Dynamics of staffing level for the positions of mid-level health professionals of the clinical laboratory service in Saint-Petersburg in outpatient settings

Таблица 1

Динамика показателей укомплектованности должностей среднего медперсонала службы клинической лабораторной диагностики Санкт-Петербурга в амбулаторных условиях оказания медицинской помощи

Годы / Years	Укомплектованность должностей / Staffing level				Коэффициент совместительства / Coefficient of spare-time work	
	занятыми ставками / employed rates		физическими лицами / natural persons			
	%	темп прироста / rate of change, %	%	темп прироста / rate of change, %	коэффициент / coefficient	темп прироста / rate of change, %
2016	82,9	–	49,4	–	1,68	–
2017	81,9	–1,3	50,9	3,0	1,61	–4,2
2018	82,2	0,4	52,3	2,6	1,57	–2,1
2019	82,6	0,5	53,8	3,0	1,54	–2,4
2020	83,8	1,4	56,2	4,4	1,49	–2,9
2021	78,8	–6,0	52,2	–7,1	1,51	1,2

number of employed positions, which showed the highest rate of decline (by 7.5%) during the same period. This fact indicates that working in an outpatient sector under the current conditions is not enough attractive for CLD physicians.

In 2021, the number of employed positions decreased compared to 2020, while the staffing coverage by physicians in clinical diagnostic laboratories increased insignificantly. It may be assumed that physicians of CLD refused from part-time work under the conditions of increased labor intensity due to a great number of COVID-19 tests, and a resultant increase in remuneration.

Full-time staffing coverage by CLD physicians with employed rates decreased by 5.4% between 2016 and 2021, and amounted to 79.3% in 2021 (Table 2). Herewith, the staffing of physician positions by individuals increased by 14.7% over the same period. CLD physician staffing ratios decreased positively from 1.7 in 2016 to 1.4 in 2021.

In 2016–2021, taking into account employed positions, the ICCDL coverage by physicians was higher than the average coverage in other laboratories of the city, and ranged from 84.4–94.5%. However, high levels of staffing coverage, including nursing staff coverage, were provided by compatibility (compatibility ratio 1.66 in 2021).

No significant differentiation is observed in staffing levels of physicians and nurses, taking into account the employed rates and individuals, as well as the compatibility coefficients. Nevertheless, the coverage by physicians is slightly higher and the compatibility rate is lower.

The ratio between laboratory physicians and nursing staff in outpatient settings in St. Petersburg is one of the lowest in the Russian Federation (1:1.97 in 2021) [4, 20]. At the same time, in 2016–2021, this indicator was lower in ICCDL than in all laboratory departments of St. Petersburg providing medical care in outpatient settings (Fig. 2). Over the 5 years, the ratio between physicians and nursing staff of the ICHDL has decreased by 13.2%.

The current correlation between specialists in St. Petersburg may be caused by five specialized departments which trained medical specialists in laboratory diagnostics. At the same time, only one educational institution (St. Petersburg State Budgetary Educational Institution "Medical College N 3") trained nursing staff. However, the current ratio of CLD physicians and nurses in St. Petersburg does not correspond to the world practice (1:4 or more) [7], leads to an increase in the workload of physicians and requires additional measures to train laboratory service specialists with secondary medical education [20].

The clinical laboratory diagnostics service is characterized by the presence of specialists with higher professional (non-medical) education (doctors-laboratorians, biologists, chemists-experts), who are assigned to perform, organize and analytical support of high-tech research (third category of complexity) in accordance

Table 2

Dynamics of staffing level for the positions of laboratory physicians in outpatient settings in Saint Petersburg

Таблица 2

Динамика показателей укомплектованности должностей врачей КЛД в амбулаторных условиях оказания медицинской помощи в Санкт-Петербурге

Годы / Years	Укомплектованность должностей / Staffing level				Коэффициент совместительства / Coefficient of spare-time work	
	занятыми ставками / employed rates		физическими лицами / natural persons			
	%	темп прироста / rate of change, %	%	темп прироста / rate of change, %	коэффициент / coefficient	темп прироста / rate of change, %
2016	83,8	–	48,9	–	1,71	–
2017	82,3	–1,9	48,4	–1,1	1,70	–0,8
2018	82,0	–0,3	49,8	2,8	1,65	–3,1
2019	87,4	6,6	55,4	11,3	1,58	–4,2
2020	86,8	–0,7	56,6	2,0	1,53	–2,7
2021	79,3	–8,7	56,1	–0,7	1,41	–8,0

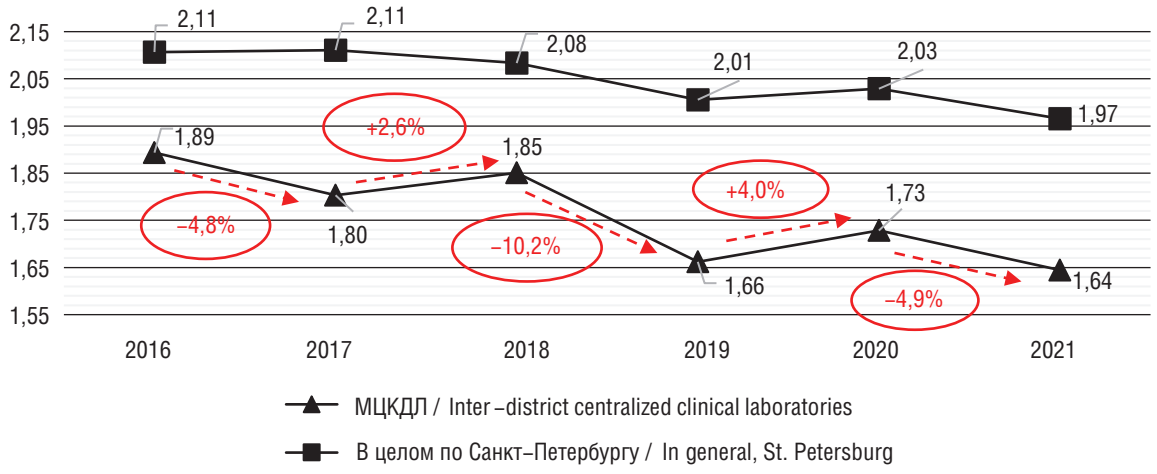

Fig. 2. Dynamics of the 'laboratory physician — mid-level health professionals' ratio of the clinical laboratory service in Saint Petersburg in outpatient settings

Рис. 2. Динамика соотношения численности физических лиц «врач КЛД — средний медперсонал» службы клинической лабораторной диагностики Санкт-Петербурга в амбулаторных условиях

with the professional standard [13]. Thus, the clinical laboratory diagnostics service is partly able to cover the deficiency of medical staffing.

In 2026–2021, the number of this category of laboratory service specialists in St. Petersburg tended to increase against the background of extensive growth of staff units and employed positions. The identified increase in the number of biologists and expert chemists occurred simultaneously with a decrease in the number of laboratory physicians (visibility indicator for staff and employed positions in outpatient settings — 44.5 and 57.6%, respectively, for individuals — 19.2%).

The negative dynamics of the number of laboratory doctors is the result of systematic progressive development of the service, since positions of laboratory doctor had been retained for specialists with higher non-medical education, admitted to this position before 1 October 1999 [9].

However, it should be noted that in 2021 there were 9 specialists with higher non-medical education working as "doctor of clinical laboratory diagnostics" in laboratory departments of St. Petersburg, providing medical care in outpatient clinics. This situation is probably caused by specialists with higher professional (non-medical) education, who previously held the position of "laboratory doctor", being transferred to the position of "doctor of clinical laboratory diagnostics" during 1997–2014 [22]. Such a phenomenon contradicts requirements of the professional standard 'Specialist in the field of clinical laboratory diagnostics and the order of the Ministry of Health and Social Development of Russia from 23.07.2010 N 541n [9, 13], according to which only a specialist with higher education in one of the medical specialties listed in the relevant documents can be appointed to the position of a doctor of clinical laboratory diagnostics.

The current situation requires bringing medical specialists of the laboratory service into compliance with the job description. In 2016–2021, the coverage by specialists with higher non-medical education increased by 10.9 (employed rates) and 18.3% (individuals), which may reflect new technologies which were introduced in laboratory practice. Compatibility ratio decreased by 1.5% compared to 2016 and amounted to 1.25 (Table 3).

At the same time, the ICHDL demonstrates aa reduction of positions and individuals among specialists with higher non-medical education due to elimination of biologist positions. According to available assessments, biologist positions are reduced as laboratory services are developing [3]. Positions of clinical laboratory specialists with non-medical education should correspond to their specialties involving high-tech research.

Population of St. Petersburg is provided by specialists of the clinical laboratory diagnostics

Table 3

Dynamics of staffing level for the positions of higher education (non-medical) professionals of the clinical laboratory service in Saint Petersburg in outpatient settings

Таблица 3

Динамика показателей укомплектованности должностей специалистов с высшим профессиональным (немедицинским) образованием службы клинической лабораторной диагностики Санкт-Петербурга в амбулаторных условиях оказания медицинской помощи

Годы / Years	Укомплектованность должностей / Staffing level				Коэффициент совместительства / Coefficient of spare-time work	
	занятыми ставками / employed rates		физическими лицами / natural persons			
	%	темп прироста / rate of change, %	%	темп прироста / rate of change, %	коэффициент / coefficient	темп прироста / rate of change, %
2016	85,1	–	63,8	–	1,33	–
2017	88,2	3,6	52,4	–17,9	1,68	26,2
2018	87,3	–1,0	54,9	4,8	1,59	–5,5
2019	93,5	7,0	73,9	34,6	1,26	–20,4
2020	94,2	0,7	74,2	0,4	1,27	0,3
2021	94,4	0,3	75,5	1,7	1,25	–1,5

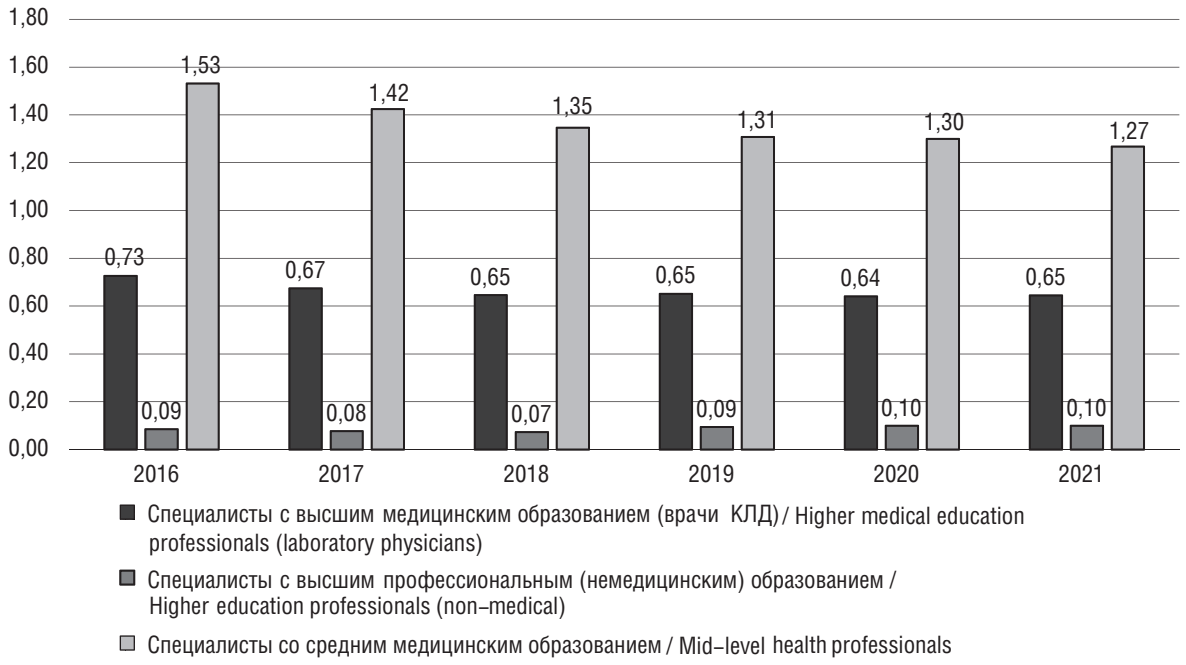

Fig. 3. Dynamics of staffing of the clinical laboratory service in outpatient settings in Saint Petersburg, per 10,000 population

Рис. 3. Динамика обеспеченности населения кадрами службы клинической лабораторной диагностики в амбулаторных условиях в Санкт-Петербурге, на 10 тыс. населения

service in a less degree. In 2021 the availability of clinical laboratory diagnostics specialists in outpatient settings decreased and amounted to 1.27 for nursing staff, 0.65 — for CLD physicians and 0.1 — for biologists, expert chemists and laboratory physicians per 10 thousand population (Fig. 3), which is significantly lower than the average availability of these specialists in all laboratories of the city (similar indicators were 4.2, 1.97 and 0.34 per 10 thousand population, respectively).

At the same time, it is worth noting that there has been no decline in the number of CLD physicians since 2018, which is a positive trend, because physicians have the greatest responsibility

for interacting with primary care physicians and providing primary health and sanitary health care.

CONCLUSION

In general, in 2016–2021, the development of a human resources potential of the clinical laboratory diagnostics service of St. Petersburg concerning provision of primary health care can be considered favorable due to:

- growing staffing levels of regular physician and nurse rates, growing number of positions and individuals, as well as staffing coverage by specialists with higher non-medical education;
- reduction of the compatibility rate among CLD physicians.

At the same time, the ratio of CLD doctors to nursing staff is one of the lowest among the regions, which requires the adoption of organizational measures to train laboratory specialists with secondary medical education. The growth of staffing coverage by specialists with higher non-medical education is important for further high-tech research, which is important within the framework of a value-oriented approach in a health care system. Moreover, it ensures laboratory monitoring of metropolitan patients with chronic diseases in response to a continuing trend of population ageing.

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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QUALITY MANAGEMENT SYSTEM IN THE PREVENTION OF COMPLICATIONS AND ERRORS IN NEUROSURGERY

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ABSTRACT. Complications and side effects are undesirable but inevitable events in any medical specialty, including neurosurgery. The professionalism and experience of a specialist play an important role in the prevention and timely detection of negative events, but they cannot ensure complete patients' safety, which is largely determined by the entire work of the clinic and communications between various services and specialists. The quality management system (QMS), as a systematic approach to the prevention of negative events, has proven its effectiveness in medical practice. According to a number of studies, more than half of adverse perioperative cases can be avoided by implementing various systemic patients' safety strategies. The article presents a review of the literature on the implementation of various QMS tools in the work of neurosurgical departments and clinics. A number of studies have shown that the introduction of a surgical safety checklist into neurosurgical practice contributes to a significant reduction in the frequency of erroneous operations on the wrong side, reduces the number of infectious complications, and generally improves treatment outcomes. In addition to standardizing processes and introducing checklists, risk management tools are effective in reducing the number of complications and side effects associated with making clinical decisions and communication problems. According to some studies, risk management helps to reduce the number of adverse cases and choose the optimal tactics for managing patients with neurosurgical pathology. In general, it is worth noting that QMS tools primarily help prevent the most obvious and recurring undesirable cases, but do not always protect against exclusive ones. Nevertheless, this is quite justified, since it is not rare and exclusive, that most frequently recurring complications and errors contribute most to the unsatisfactory results of the treatment of neurosurgical patients.

KEY WORDS: complications; errors; neurosurgery; surgery; patient safety; standardization; checklist.

СИСТЕМА МЕНЕДЖМЕНТА КАЧЕСТВА В ПРОФИЛАКТИКЕ ОСЛОЖНЕНИЙ И ОШИБОК В НЕЙРОХИРУРГИИ

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РЕЗЮМЕ. Осложнения и ошибки являются нежелательными, но неизбежными событиями в любых медицинских специальностях, в том числе в нейрохирургии. Профессионализм и опыт специалиста имеют большую роль в профилактике и своевременном выявлении негативных событий, однако не могут обеспечить полную безопасность пациента, определяемую во многом работой всей клиники и коммуникациями между различными службами и специалистами. Система менеджмента качества (СМК) как системный подход в профилактике негативных событий доказала свою эффективность в медицинской практике. По данным ряда исследований, более половины нежелательных периоперационных событий можно избежать при внедрении различных системных стратегий безопасности пациентов. В статье представлен обзор литературы по внедрению различных инструментов СМК в работу нейрохирургических отделений и клиник. В ряде исследований было доказано, что внедрение чек-листа хирургической безопасности в нейрохирургическую практику способствует значимому снижению частоты ошибочных операций с противоположной стороны от очага поражения, снижает количество инфекционных осложнений и в целом улучшает исходы лечения. Кроме стандартизации процессов и внедрения чек-листов, для снижения количества осложнений и ошибок, связанных с принятием клинических решений и проблемами с коммуникацией, эффективны инструменты риск-менеджмента. По данным некоторых исследований, риск-менеджмент помогает снизить количество неблагоприятных событий и выбрать оптимальную тактику ведения пациентов с нейрохирургической патологией. В целом стоит отметить, что инструменты СМК в первую очередь позволяют предотвратить наиболее очевидные и повторяющиеся нежелательные события, но не всегда защищают от эксклюзивных. Тем не менее это весьма оправданно, так как не редкие и эксклюзивные, а именно наиболее часто повторяющиеся осложнения и ошибки вносят наибольший вклад в неудовлетворительные результаты лечения нейрохирургических пациентов.

КЛЮЧЕВЫЕ СЛОВА: осложнения; ошибки; нейрохирургия; операция; безопасность пациента; стандартизация; чек-лист.

INTRODUCTION

In order to carry out preventive interventions for adverse medical events, including surgery, it is necessary to understand which adverse events are preventable and which are not. Thus, all negative events can be classified according to their preventability using the Likert scale. According to the scale, all negative events can be divided into several groups:

1) definitely impossible to prevent;
2) a probability of prevention is less than 50%;
3) a probability of prevention is more than 50%;
4) definitely preventable [14].

The first group includes rare types of complications associated with individual risk factors of a patient and a course of his/her disease, which are practically impossible to foresee, identify and/or influence in time. For example, there might be carotid-vertebrobasilar anastomoses,

which provide blood supply to the brainstem and cerebellum for a short time in the embryonic period, but in some cases continue to persist in adults. The primitive trigeminal artery is the most common, occurring in 0.1–0.3% of cases in the population. Some authors have reported that the presence of this artery can lead to difficulty in anatomical orientation and cause serious complications during skull base surgery [13, 24].

The second and third groups can include complications that are conditionally preventable and are determined by both risk factors on the part of the patient himself and the risks inherent in the therapeutic and diagnostic processes. For example, it is known that people with diabetes mellitus have an increased risk of postoperative infectious complications. When such patients undergo endoprosthesis replacement of large joints, there is an increased incidence of periprosthetic infection [10].

These groups require preventive measures aimed at correcting modifiable risk factors and improving the quality and safety of treatment and diagnostic processes.

The fourth group includes surgical errors associated with incorrect actions of a specialist, which must be prevented.

Thus, the majority of negative perioperative events can be avoided by preventive measures at the professional and system-organizational levels.

J.M. Wong et al. identified the following systemic measures that reduce negative perioperative events in a neurosurgical clinic:

1) development and implementation of a unified national registry of treatment outcomes;
2) widespread implementation of a surgical safety checklist;
3) standardization of processes;
4) greater specialization of neurosurgeons;
5) treatment based on clinical recommendations [34].

According to A.G. Nazarenko et al., more than 50% of complications of neurosurgical interventions can be avoided by implementing various systemic patient safety strategies [7]. These statements correspond with data of a number of researchers which indicate that most often adverse events happen not because of negligence or poor training of medical personnel, but due to systemic problems of medical institution performance [4, 5].

The article “Improving patient safety in neurologic surgery” written by S.J. Han et al. mention that for a long time any errors and complications in surgery were considered as individual problems of doctors, so it was believed that if doctors do their best not to make mistakes, there will be no errors. According to the authors, this is a deep misconception, and the only way to ensure safe surgical care is to develop systematic approaches to prevent negative perioperative events [15].

QUALITY MANAGEMENT SYSTEM IN MEDICAL PRACTICE

Systemic problems should be solved by systemic methods that can be universal for different types of activities. The quality management system (QMS) was first introduced in industrial enterprises to reduce losses and improve product quality. Subsequently, effective QMS tools and methods were introduced into medical practice.

At present, QMS in medicine implies the use of various methods of administrative influence (checklists, risk management, global triggers method, clinical decision aid system) aimed at achieving target indicators of quality and safety of patient treatment [2, 3, 11, 18, 31].

QMS is based on the standardization of processes, since it is difficult to conduct training and regular quality control and evaluation without it. It is difficult o standardize many interventions and procedures in medicine, and especially in surgery, nevertheless, it is possible and necessary to do so. Standardization helps to reduce a number of suboptimal or outright erroneous actions of specialists, especially when there is a lack of experience [27].

E. Suehiro et al. evaluated the impact of standardization on the mortality of patients with head injury. The study involved 869 medical centers in Japan and evaluated the period 2008–2022. The authors found that standardization had resulted in a progressive decrease in brain injury (BI) mortality since 2008. In addition, the standardization of processes enabled compliance with clinical guidelines for the management of patients with traumatic brain injury in 93.3% of cases [28].

Undoubtedly, there are situations in medicine when it is necessary to go beyond standards and recommendations due to the complexity

and/or uniqueness of a case. However, it should be recognized that in most cases, surgeons' actions may well fit into the standards of care developed by the professional community.

Standardization of processes helps not only to prevent errors and complications, but also to comply with clinical recommendations and achieve targets. Thus, the order of the Ministry of Health of the Russian Federation N 203n dated 10.05.2017 "On Approval of Criteria for Assessing the Quality of Medical Care" outlines the recommended quantitative indicators of treatment and diagnostic processes in various diseases, including neurosurgery [9]. According to A.M. Karsanov et al., the Order specifies the target indicators to which it is necessary to strive, but does not specify the ways to achieve them. According to the authors, QMS and process standardization are tools that allow to determine the ways to achieve the target indicators based on existing standards and clinical recommendations [2].

STANDARDIZATION OF SAFETY APPROACHES BY MEANS OF CHECKLIST METHOD

Checklists are one of the effective and simple methods of regular quality control and prevention of system errors. Checklists are quite common in industrial enterprises and serve as a reliable tool for preventing recurring undesirable events, primarily related to human factors. The positive experience of using checklists was subsequently introduced into medical practice. Thus, in 2009, the World Health Organization (WHO) developed a surgical safety checklist recommended for implementation in all surgical clinics.

According to WHO recommendations, three stages of surgery are distinguished, defining "time-outs" and checking key indicators on the following checklist:

1) the period of anaesthetic induction;
2) the period after the induction and before surgical incision;

До начала анестезии	До рассечения кожи	До того, как пациент покинет операционную
(в присутствии, как минимум, медсестры и анестезиолога)	(в присутствии медсестры, анестезиолога и хирурга)	(в присутствии медсестры, анестезиолога и хирурга)
Подтвердил ли пациент свое имя, место операции, процедуру и согласие? ☐ Да	☐ Подтвердите, что все члены бригады представились по имени и назвали свою роль	**Медсестра устно подтверждает:** ☐ Наименование процедуры ☐ Подсчет количества инструментов, тампонов и игл завершен ☐ Образцы маркированы (зачитывает надписи на образцах, включая имя пациента) ☐ Имеются проблемы с оборудованием, требующие устранения
Маркировано ли место операции? ☐ Да ☐ Не применимо	☐ Подтвердите имя пациента, процедуру и место, где будет проведено рассечение Проводилась ли антибиотикопрофилактика последние 60 минут? ☐ Да ☐ Не применимо	
Проведена ли проверка оборудования и лекарственных средств для анестезии ☐ Да		
Пульсоксиметр зафиксирован на пациенте и функционирует? ☐ Да	**Ожидаемые критические события:** С точки зрения хирурга: ☐ Критические или неожиданные меры ☐ Длительность операции? ☐ Ожидаемая кровопотеря?	**Хирург, анестезиолог и медсестра:** ☐ Каковы основные проблемы, касающиеся реабилитации и ведения данного пациента?
Имеется ли у пациента: Известная аллергия? ☐ Нет ☐ Да	С точки зрения анестезиолога: ☐ Специфичные для данного пациента проблемы?	
Проблемы дыхательных путей и риск аспирации? ☐ Нет ☐ Да, имеется оборудование / необходимая помощь	С точки зрения операционных сестер: ☐ Стерильность (включая показания приборов) подтверждена? ☐ Проблемы с оборудованием или иные вопросы?	
Риск кровопотери >500 мл (7 мл/кг у детей)? ☐ Нет ☐ Да, предусмотрены два устройства для в/в центрального доступа и жидкости для вливания	Визуализация необходимых изображений обеспечена? ☐ Да ☐ Не применимо	

Fig. 1. Checklist for safety control of surgical intervention

Рис. 1. Чек-лист контроля безопасности оперативного вмешательства

3) the period from wound closure to patients leaving the operating room (Fig. 1).

A.B. Haynes et al. evaluated the effectiveness of the WHO surgical safety checklist. Eight large hospitals in different countries participated in the study and 3955 operated patients were evaluated. They found that the mortality rate had been 1.5% before the checklist was introduced and decreased to 0.8% after the introduction (p=0.003). Inpatient complications occurred in 11.0% of patients before checklist introduction and in 7.0% after its implementation (p <0.001) [16].

According to J.A. Vachhani et al., the introduction of a surgical safety checklist is an effective measure to prevent operations on the opposite side of the lesion [32]. This statement corresponds with J.D. Rolston et al. The authors revealed that neurosurgeons occupy the third place after orthopedists and general surgeons in terms of performing operations on a wrong side or at a wrong level [25]. According to A. Oszvald et al, after the introduction of the surgical safety checklist into the work of the neurosurgical department, they did not observe a single case of operations on the wrong side of the lesion. The authors emphasize that checklists and time-outs are particularly effective in emergency neurosurgery [23].

M. Lepänluoma et al. evaluated the effectiveness of using a surgical safety checklist in a neurosurgical clinic. According to the authors, after implementation of the checklist, unplanned re-hospitalizations decreased from 25 to 10% (p=0.02), wound complications decreased from 19 to 8% (p=0.04) [15].

M. Westman et al. conducted a systematic review of neurosurgical publications from 2008–2016 on the use of surgical safety checklists in neurosurgery. Twenty-six articles were selected. Thus, the authors concluded that implementation of a surgical safety checklist significantly reduced the number of hospital-acquired infectious complications [33].

According to a survey conducted by M.A. Lo-Presti et al. 97.2% of neurosurgeons believed that checklists and time-outs make surgery safer, and 94.6% of respondents agreed that checklists reduce the risk of operating on a wrong side or at a wrong level [19].

There is a view that the WHO surgical safety checklist should be modified to suit specific surgical specialties, particularly neurosurgery. Thus, Indian neurosurgeons V. Suresh et al. added another 21 points to the existing 19 points of the WHO checklist which were specific to neurosurgery. They also added two more time-outs to the existing 3 ones. The authors believe that implementing such a checklist does not lengthen operative time, but it does improve communication between the anesthesiologist, neurosurgeon and operating room nurse, which helps to reduce adverse events [29]. However, it is worth noting that 5 time-outs and 40 items to check are very difficult to implement in everyday practice.

In addition to standardization and implementation of checklists, other QMS management technologies, such as risk management, can be used in medicine [20, 26].

According to N. McLaughlin et al, during the period 2008–2012, the neurosurgery department received the highest number of lawsuits out of all surgical departments in the hospital (30 out of 176). Among these lawsuits, 21 were related to spinal pathologies and 9 were related to cranial pathologies. The most common adverse perioperative events were related to suboptimal clinical decisions (20 of 30), technical skills (19 of 30), and communication problems (6 of 30). The authors decided that risk management strategies should be implemented at the clinic level to address the most frequent factors influencing adverse events [21].

PRINCIPLES OF RISK MANAGEMENT

According to A.M. Karsanov et al. medecine should include the following components of risk management:

- timely detection of a real (potential) negative event or dangerous situation;
- effective analysis of its causes and consequences;
- informing the medical staff about an undesirable (negative) event that has occurred;
- constructive conclusions based on the analysis of errors;
- prevention of repetition of such a negative event [2, 3].

F. Ikawa et al. determined the most optimal tactics of treatment for patients with aneurysmal subarachnoid haemorrhage (SAH) in the older age group taking into account risk management [17].

New Zealand researchers S. Clark et al. analyzed a 5-year period of treatment of 18,375

neurosurgical patients and developed a risk scale for mortality in the first 30 days, as well as 1 and 2 years after surgery. Based on the data obtained, the authors created the NZRISK-NEURO calculator, which allows to generate an individual risk for neurosurgical patients, which in some cases may help to facilitate clinical decision making, and also allows to provide the patient and his relatives with an early probability of an unfavorable outcome [12]. Screenshots from https://www.nzrisk.com/#calculate are presented below. It is possible to calculate the risk of any neurosurgical procedure (Fig. 2).

The Global Trigger Tool is a type of risk management developed by the Institute for Healthcare Improvement (Institute for Healthcare Improvement, USA). Trigger is an indicator of possible unfavorable event development. The essence of this method is an automatic search for special triggers in a patient's medical history.

Triggers are divided into the following groups:

1) triggers of significant deterioration of the condition;
2) triggers of postoperative complications;
3) triggers of nosocomial infection;
4) triggers of undesirable drug reactions.

The trigger system allows both simplifying the search for an undesirable event and identifying implicit negative events [1].

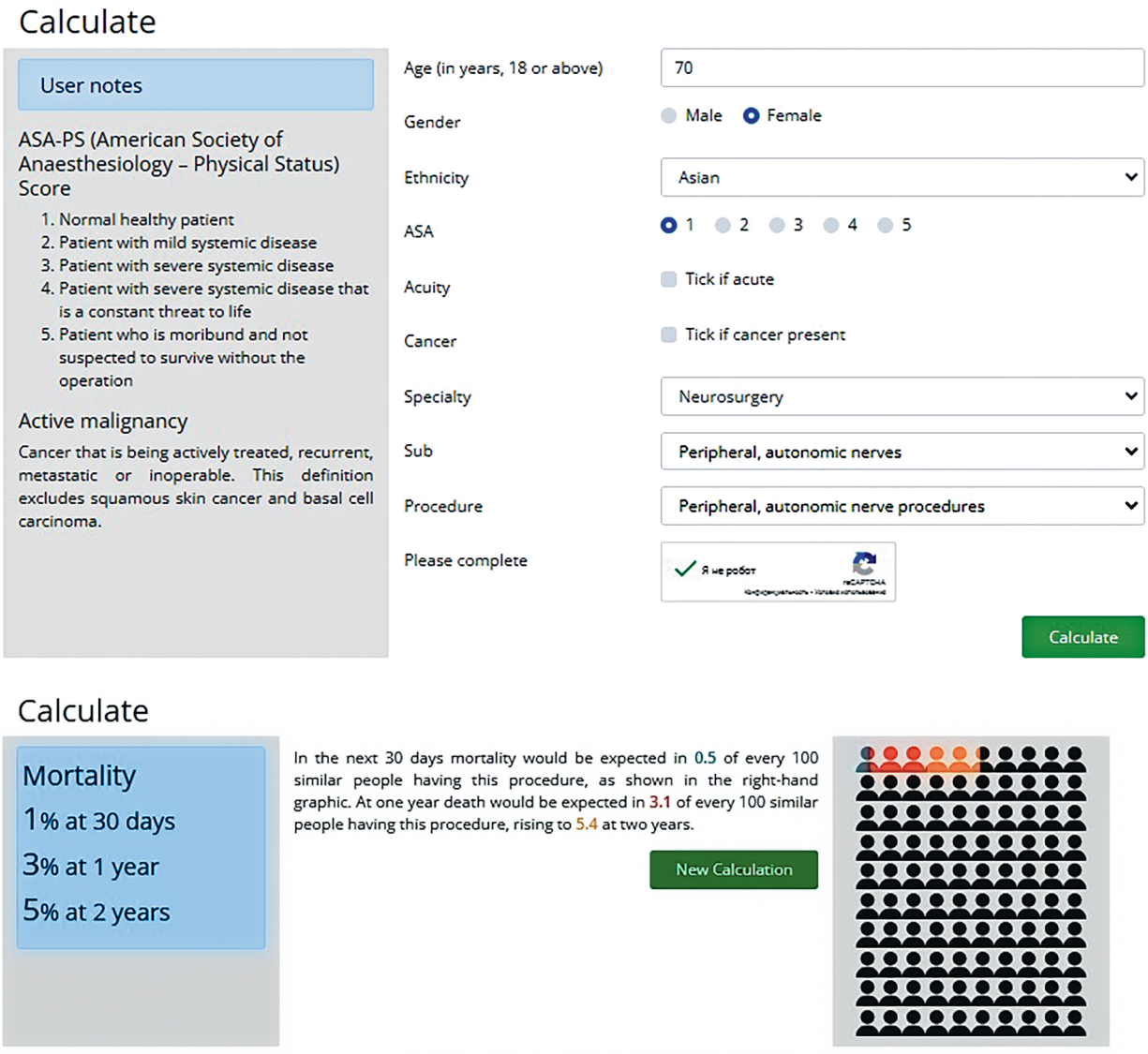

Fig. 2. Neurosurgical procedure risk calculator

Рис. 2. Калькулятор риска нейрохирургической процедуры

The book 'Key Quality Indicators of Neurosurgical Clinic Performance' wrote by A.G. Nazarenko et al. identified the following triggers for the development of postoperative complications in neurosurgery:

a) unplanned resuscitation activities within 24 hours after surgery;
b) artificial lung ventilation (ALV) for more than 24 hours after surgery;
c) unplanned repeated surgical interventions in one hospitalization;
d) haemotransfusion above the planned volumes within 24 hours after surgery;
e) increase of cytosis in the liquor more than 2-fold, etc. [7].

Another useful tool for quality and safety management in surgery is the clinical decision support and decision-making system. A.S. Orlov et al. developed an information system for clinical decision support in neurology and neurosurgery. This system takes into account orders of the Ministry of Health of the Russian Federation, treatment standards, clinical recommendations, and treatment protocols for each clinical case. The authors rightly emphasize that these documents are quite voluminous and it is not easy for a doctor to incorporate them. That is the reason the information system of decision support was developed [8].

PRINCIPLES OF IMPLEMENTING QMS TOOLS

It should be noted that the implementation of a number of QMS technologies and tools requires certain skills and knowledge. According to the QMS, it is necessary to answer three questions when implementing a process [6]:

1. What are we trying to achieve?
2. How do we know that the planned changes will lead to a better result?
3. What changes should we make to achieve the targets?

In the next stage of implementation, it is optimal to use Deming's Plan-Do-Study-Act (PDSA-cycle), which is well known in management. The cycle consists of the following steps:

- P (plan) — "plan". Develop an implementation plan to improve results.
- D (do) — "do". Practical implementation of the intended actions.
- S (study) — "study". Analyzing the results obtained and comparing them with those anticipated at the planning stage.
- A (act) — "influence". Final implementation of the intended changes or their correction.

The sequence of steps of the PDSA-cycle can be repeated many times using the knowledge obtained in the previous stages [6, 22, 30].

After all the data presented, one may get the impression that the high art of neurosurgery is reduced to simplified standards and algorithms of action. Undoubtedly, it is not so. Apart from a number of actions regulated by standards and guidelines, surgery, more than any other medical specialty, has a capacity to go far beyond. This includes surgery itself and unforeseen situations where clinical thinking, experience and skills of a specialist are required. Nevertheless, as seen in this review, standardization of processes and management tactics in accordance with approved clinical guidelines contribute to reduction of complications and errors in neurosurgery. The words of Academician V.A. Kubyshkin sound very appropriate in this regard: 'When making a decision in surgical disciplines concerning a rational sequence of diagnostic methods and even a method of surgery, "voluntarism" has special consequences' [5].

CONCLUSION

The quality management system, developed in the first half of the XX century to optimize processes in industrial enterprises, has found wide application in medicine in the XXI century. Numerous studies have proven that various QMS tools such as standardization of processes, implementation of checklists, risk management, decision support system, etc., help to reduce the number of complications and errors in everyday medical practice. This is especially relevant for surgical specialties, where the initial risk of various perioperative negative events is high.

It is worth noting that QMS tools primarily prevent the most obvious and recurrent negative events, but do not always protect against exclusive ones. Nevertheless, this is quite justified, since these complications are not rare and exclusive. These are most frequently repeated complications and errors that contribute the most to unsatisfactory treatment results.

In order to implement standardization successfully and without meeting great resistance from some specialists, it is necessary to familiarize doctors with the results of such imple-

mentation in other clinics of the same or higher level. For instance, if surgeons are familiarized with the results of implementing the WHO check-list of surgical safety in a number of foreign clinics, which led to excluding a possibility of surgery on an opposite side of the lesion, a twofold decrease in the number of infectious complications and repeated surgeries, then the check-list will be implemented with less resistance, and in some cases, it might be accepted with enthusiasm.

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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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.

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ORGANIZATION OF NEUROSURGICAL CARE IN A LARGE CITY (ON THE EXAMPLE OF SAINT PETERSBURG)

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ABSTRACT. The author presents the analysis of the structure of neurosurgical patients in in-patient departments of Saint-Petersburg in 2021. Parameters of in-patient and out-patient units and the status of neurosurgical care staffing were studied. The urgency of the investigation is determined by high level of nervous system morbidity and necessity of increasing quality and effectiveness of the neurosurgical service activity. The total and primary morbidity rates in the end of 2021 in St. Petersburg were 51.9 and 5.5‰, respectively. Transportation accidents became the leading external causes of morbidity and mortality. Twenty-three percent of discharged patients were diagnosed with episodic and paroxysmal disorders. The average duration of a patient's stay in a neurosurgical department was 8.8 days. The provision of the population with profile beds was $9{,}9^{0}/_{0000}$, but the inpatient units showed overload activities (the average duration of a bed exceeded 340 days and the capacity of the inpatient unit was more than 100%). The average duration of bed work was 359 days per year, the average duration of treatment per patient was 8.8 days, bed turnover was 35.9, and mortality rate was 1.7%. There were 23% of patients under outpatient observation. Specialized outpatient care is underdeveloped. The staffing level was 83.5% (83.7% in the inpatient unit, 75% in the outpatient unit). The coefficient of compatibility was 1.2. The highest qualification category was presented by 30,2% of doctors, the first category — by 13,2%, the second — by 5%; 51,7% of doctors-neurosurgeons were not certified.

KEY WORDS: neurosurgical service; inpatient care; outpatient care; neurosurgical staffing.

ОРГАНИЗАЦИЯ НЕЙРОХИРУРГИЧЕСКОЙ ПОМОЩИ В КРУПНОМ ГОРОДЕ (НА ПРИМЕРЕ Г. САНКТ-ПЕТЕРБУРГ)

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РЕЗЮМЕ. Представлен анализ структуры пациентов нейрохирургического профиля в стационарах г. Санкт-Петербург в 2021 году. Изучены показатели работы стационарного и амбулаторно-поликлинического звеньев и состояние кадров нейрохирургической службы. Актуальность исследования определяется высоким уровнем заболеваемости нервной системы и необходимостью повышения качества и эффективности оказания специализированной высококвалифицированной медицинской помощи данной категории пациентов. Общая и первичная заболеваемость на конец 2021 года в Санкт-Петербурге составили 51,9 и 5,5$^{0}/_{00}$ соответственно. Транспортные происшествия стали основными из внешних причин заболеваемости и смертности. У 23% выписанных пациентов был диагноз «эпизодические и пароксизмальные расстройства». Средняя продолжительность пребывания пациента на нейрохирургическом отделении — 8,8 дней. Обеспеченность населения профильными койками — 9,9$^{0}/_{0000}$, однако стационары работали с перегрузкой (средняя длительность работы койки превышала 340 дней и пропускная способность стационара была больше 100%). Средняя длительность работы койки — 359 дней в год, средняя длительность лечения одного пациента — 8,8 дней, оборот койки — 35,9 больных, летальность — 1,7%. Под диспансерным наблюдением находилось 23% пациентов. Специализированная амбулаторная помощь развита недостаточно. Укомплектованность штатов — 83,5% (в стационаре — 83,7%, в амбулаторном звене — 75%). Коэффициент совместительства — 1,2. Высшую квалификационную категорию имели 30,2% врачей, первую — 13,2%, вторую — 5%; 51,7% врачей-нейрохирургов были не аттестованы.

КЛЮЧЕВЫЕ СЛОВА: нейрохирургическая служба; стационарная помощь; амбулаторно-поликлиническое звено; кадры нейрохирургической службы.

INTRODUCTION

Relevance of the research is determined by a high level of morbidity associated with lesions of the nervous system and a necessity to improve the quality and efficiency of neurosurgical care [2–4, 6, 8]. At the end of 2021, morbidity in St. Petersburg amounted to 51.9 per 1 thousand people, primary morbidity — 5.5 per 1 thousand people. The hospitalization rate amounted to 2.8 per 1 thousand people. The growth of general morbidity and morbidity among neurosurgical patients is associated with the aging of the population of St. Petersburg, which determines the need to improve a current model of specialized neurosurgical care taking into account regional peculiarities. Nowadays, a basic program of compulsory medical insurance (CMI) is being actively expanded and inpatient medical care is no longer funded from different state budgets [19], which raises a need to modernize the outpatient neurosurgical service. In addition, no detailed studies of the neurosurgical service in St. Petersburg have been conducted since the COVID-19 pandemic. The article analyzes the composition of neurosurgical patients in St. Petersburg hospitals in 2021, the performance indicators of inpatient and outpatient neurosurgical care, and an assessment of the neurosurgical service personnel.

AIM

Statistical evaluation of performance indicators of neurosurgical service in St. Petersburg in 2021.

MATERIALS AND METHODS

Reports (forms 12, 14, 30) for 2021 have been analyzed in the research. A continuous method of research has been performed. According to Form 12, 278,983 cases of neurological diseases have been examined, according to Form 14, 15,146 cases of neurological diseases have been studied, and according to Form 30, 16,682 visits of patients with neurosurgical diseases made by primary care physicians have been examined.

RESULTS

Neurosurgical medical care is provided as primary medical and sanitary care, emergency, including specialized emergency medical care, and specialized, including high-tech medical care [8, 12, 15, 22, 24, 27] (Fig. 1).

In 2021, transport accidents occupied the leading position among external causes of morbidity and mortality associated with lesions of the nervous system in St. Petersburg; more than half of them are road traffic accidents. The main cause of hospitalization at neurosurgical departments was eye and eye socket trauma (ICD-10 code — S05), intracranial trauma (ICD-10 code — S06) took the second place (Table 1).

Three main ways of patient admission to neurosurgical departments have been identified (Fig. 2): patient self-referral ("gravity flow"), patient referral by other specialists, and patient delivery by ambulance [2, 3, 11, 12, 15, 16, 21].

In 2021 in St. Petersburg there were 15,146 people with diseases of the nervous system — 57.8% of patients were hospitalized in neurosurgical departments for emergency indications. Of these, 76.6% of patients were delivered by ambulance (Table 2).

The largest share among the hospitalized patients (12,675 patients) was accounted for by patients diagnosed with episodic and paroxysmal disorders (ICD-10 code — G40–G47) (Fig. 3).

The average duration of a patient's stay at the neurosurgical department was 8.8 days (Table 3). The average duration of stay in medical organizations under the jurisdiction of the Health Committee was 7.97 days, in medical organizations under the jurisdiction of the Ministry of Health — 10.88 days. Longer periods can be explained by hospitalization of mainly planned patients referred for high-tech surgical interventions.

The mortality rate at neurosurgical departments in St. Petersburg in 2021 was 1.7%. Most of them were patients diagnosed with degenerative diseases of the nervous system (ICD-10 code — G30–G31) (Fig. 4).

By the end of 2021, inpatient care in St. Petersburg consisted of 385 beds for the adult population (60.5% of them are located in medical organizations under the jurisdiction of the Health Committee, 39.5% — in medical organizations under the jurisdiction of the Ministry of Health), with a bed capacity of 9.90/0000. The average duration of a hospital bed operation is 359 days per year, the average bed turnover

Fig. 1. Routing of neurosurgical patients

Рис. 1. Маршрутизация пациентов нейрохирургического профиля

Table 1

External causes of morbidity and mortality related to nervous system damage (adults — 18 years and older), Saint Petersburg, 2021 (%)

Таблица 1

Внешние причины заболеваемости и смертности, связанные с повреждением нервной системы (у взрослых — 18 лет и старше), Санкт-Петербург, 2021 г. (%)

Травмы от воздействия внешних причин / Injuries from external causes	**Код по МКБ 10-го пересмотра / ICD-10 revision code**	**Внешние причины заболеваемости и смертности, всего / External causes of morbidity and mortality, total**		**Транспортные несчастные случаи / Transportation accidents**			
				всего (из 3) / total (of 3)		**дорожно-транспортные несчастные случаи (из 4) / traffic accidents (of 4)**	
		абс. / abs.	**относ. (%) / rel. (%)**	**абс. / abs.**	**относ. (%) / rel. (%)**	**абс. / abs.**	**относ. (%) / rel. (%)**
1	2	3		4		5	
Всего / Total	S00–T98	516 839	100	7705	1,5	4237	55
Травмы головы, всего / Head trauma, total	S00–S09	66 163	12,8	1366	2,1	709	51,9
Перелом черепа и лицевых костей / Fracture of the skull and facial bones	S02	5190	1	74	1,4	49	66,2
Травма глаза и глазницы / Trauma to the eye and eye socket	S05	22 317	4,3	32	0,1	7	21,9
Внутричерепная травма / Intracranial trauma	S06	13 542	2,6	785	5,8	403	51,3
Травмы шеи, всего / Neck trauma, total	S10–S19	3111	0,6	204	6,6	127	62,3
Перелом шейного отдела позвоночника / Fracture of the cervical spine	S12	345	0,1	22	6,4	11	50
Травма нервов и спинного мозга на уровне шеи / Nerve and spinal cord trauma at the level of the neck	S14	35	0	2	5,7	2	100
Прочие / Other	S20–T98	447 565	86,6	6135	1,4	3401	55,4

is 35.9 patients, and the bed downtime is 0.2 days. Throughput capacity of the hospital is 100.1% (Table 4).

The frequency of outpatient visits to neurosurgeons in St. Petersburg in 2021 was 3.37 per 1000 population (Table 5). The main focus of medical specialists is regular follow-up monitoring according to the profile of pathology. 23% of patients were under follow-up monitoring, 11% were diagnosed for the first time. At the end of 2021, 54,516 people were under medical follow-up monitoring (Table 6).

Availability of neurosurgeons in St. Petersburg in 2021 was equal to 0.50/0000. The staffing level was 83.5% (83.7% in inpatient care and 75% in outpatient care) (Tables 7, 8). The compatibility rate was 1.2.

Professional characteristics of neurosurgical specialists in St. Petersburg in 2021 have been assessed. The analysis showed that a fairly large percentage of doctors do not have a qualification category. The distribution of specialists by qualification categories suggests low interest of neurosurgeons in improving their qualifications (Table 9).

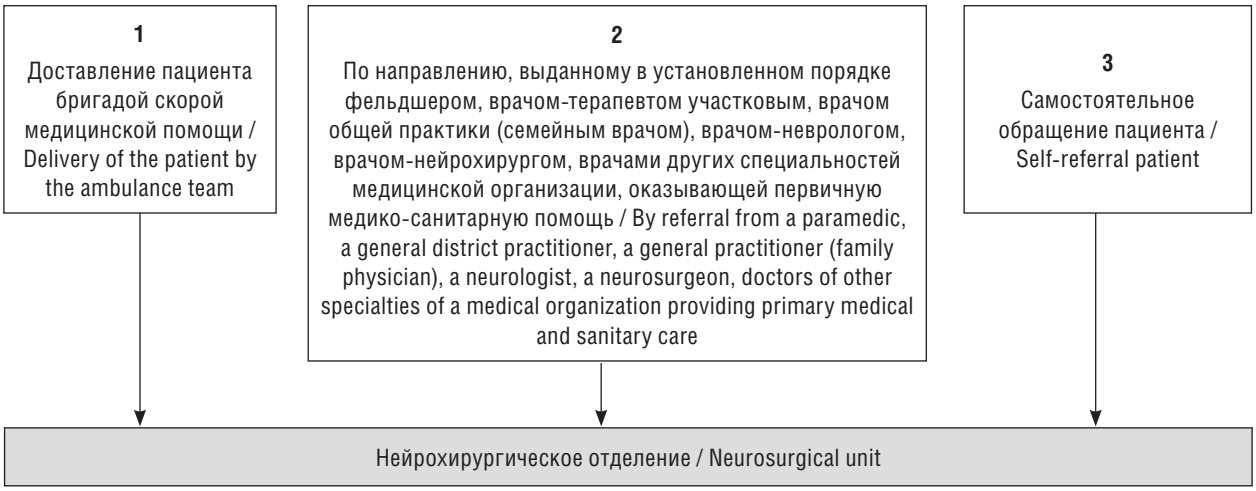

Fig. 2. Pathways of admission to the neurosurgery department

Рис. 2. Пути поступления пациентов на отделение нейрохирургического профиля

Table 2

Distribution of discharged patients with diseases of the nervous system by type of medical organization and the number of patients delivered from them for emergency indications (adults — 18 years and older), Saint Petersburg, 2021 (%)

Таблица 2

Распределение выписанных пациентов с болезнями нервной системы по типам медицинских организаций и количество доставленных из них по экстренным показаниям (взрослые — 18 лет и старше), Санкт-Петербург, 2021 г. (%)

Типы медицинских организаций и пути госпитализации пациентов / Types of medical organisations and ways of hospitalisation of patients		**Группы / Groups**	**Абс. / Abs.**	**Относ. (%) / Rel. (%)**
Всего / Total	Всего выписанных пациентов / Total discharged patients	1	15 146	100
	Из них доставленных по экстренным показаниям (из 1) / Of these, delivered on emergency basis (of 1)	2	8759	57,8
	Из них пациентов, доставленных скорой медицинской помощью (из 2) / Of these, patients delivered by ambulance (of 2)	3	6705	76,6
МО КЗ / Medical organizations of the health committee	Всего выписанных пациентов / Total discharged patients	4	11 083	73,2
	Из них доставленных по экстренным показаниям (из 4) Of these, delivered on emergency basis (of 4)	5	8626	77,8
	Из них пациентов, доставленных скорой медицинской помощью (из 5) / Of these, patients delivered by ambulance (of 5)	6	6663	77,2
МО МЗ / Medical organizations of the Ministry of Health	Всего выписанных пациентов / Total discharged patients	7	4063	26,8
	Из них доставленных по экстренным показаниям (из 7) / Of these, delivered on emergency basis (of 7)	8	133	3,3
	Из них пациентов, доставленных скорой медицинской помощью (из 8) / Of these, patients delivered by ambulance (of 8)	9	42	31,6

Table 3

Average length of stay for various illnesses in hospital (adults — 18 and over), Saint Petersburg, 2021 (bed-days)

Таблица 3

Средняя продолжительность пребывания при различных заболеваниях в стационаре (взрослые — 18 лет и старше), Санкт-Петербург, 2021 г. (койко-дни)

Наименование болезни / Name of the disease	**Код по МКБ 10-го пересмотра / ICD 10 revision code**	**Всего / Total**	**МО КЗ / Medical organizations of the Health Committee**	**МО МЗ / Medical organizations of the Ministry of Health**
Болезни нервной системы / Diseases of the nervous system	G00–G98	8,75	7,97	10,88
Воспалительные болезни центральной нервной системы / Inflammatory diseases of the central nervous system	G00–G09	20,97	22,50	14,25
• бактериальный менингит / bacterial meningitis	G00	18,88	20,00	10,50
• энцефалит, миелит и энцефаломиелит / encephalitis, myelitis and encephalomyelitis	G04	20,38	21,49	15,00
Системные атрофии, поражающие преимущественно центральную нервную систему / Systemic atrophies affecting mainly the central nervous system	G10–G12	13,89	17,38	9,41
Экстрапирамидные и другие двигательные нарушения / Extrapyramidal and other motor disorders	G20, G21, G23–G25	9,41		
• болезнь Паркинсона / Parkinson's disease	G20	10,18		
• другие экстрапирамидные и двигательные нарушения / other extrapyramidal and motor disorders	G25	9,27		
Другие дегенеративные болезни нервной системы / Other degenerative diseases of the nervous system	G30–G31	24,23		
• болезнь Альцгеймера / Alzheimer's disease	G30	56,63		
Демиелинизирующие болезни центральной нервной системы / Demyelinating diseases of the central nervous system	G35–G37	17,74		
• рассеянный склероз / multiple sclerosis	G35	19,34		15,47
Эпизодические и пароксизмальные расстройства / Episodic and paroxysmal disorders	G40–G47	4,72		10,35
• эпилепсия, эпилептический статус / epilepsy, epileptic status	G40–G41	3,98		12,10
• преходящие транзиторные церебральные ишемические приступы (атаки) и родственные синдромы / Transient transient cerebral ischemic attacks and related syndromes	G45	5,94		9,13
Поражения отдельных нервов, нервных корешков и сплетений, полиневропатии и другие поражения периферической нервной системы / Lesions of individual nerves, nerve roots and plexuses, polyneuropathies and other lesions of the peripheral nervous system	G50–G64	11,95		10,24
• синдром Гийена–Барре / Guillain–Barre syndrome	G61.0	19,99		18,20
Болезни нервно-мышечного синапса и мышц / Diseases of the neuromuscular synapse and muscles	G70–G73	21,37		11,90
• миастения / myasthenia	G70.0, 2	13,80		11,60

Ending of the table 3

Окончание табл. 3

Наименование болезни / Name of the disease	Код по МКБ 10-го пересмотра / ICD 10 revision code	Всего / Total	МО КЗ / Medical organizations of the Health Committee	МО МЗ / Medical organizations of the Ministry of Health
• мышечная дистрофия Дюшенна / Duchenne muscular dystrophy	G71.0	17,33		10,00
Церебральный паралич и другие паралитические синдромы / Cerebral palsy and other paralytic syndromes	G80–G83	8,18		9,31
• церебральный паралич / cerebral paralysis	G80	5,58		6,78
Расстройства вегетативной (автономной) нервной системы / Disorders of the autonomic nervous system	G90	0,00		0,00
Сосудистые миелопатии / Vascular myelopathies	G95.1	19,88		19,27

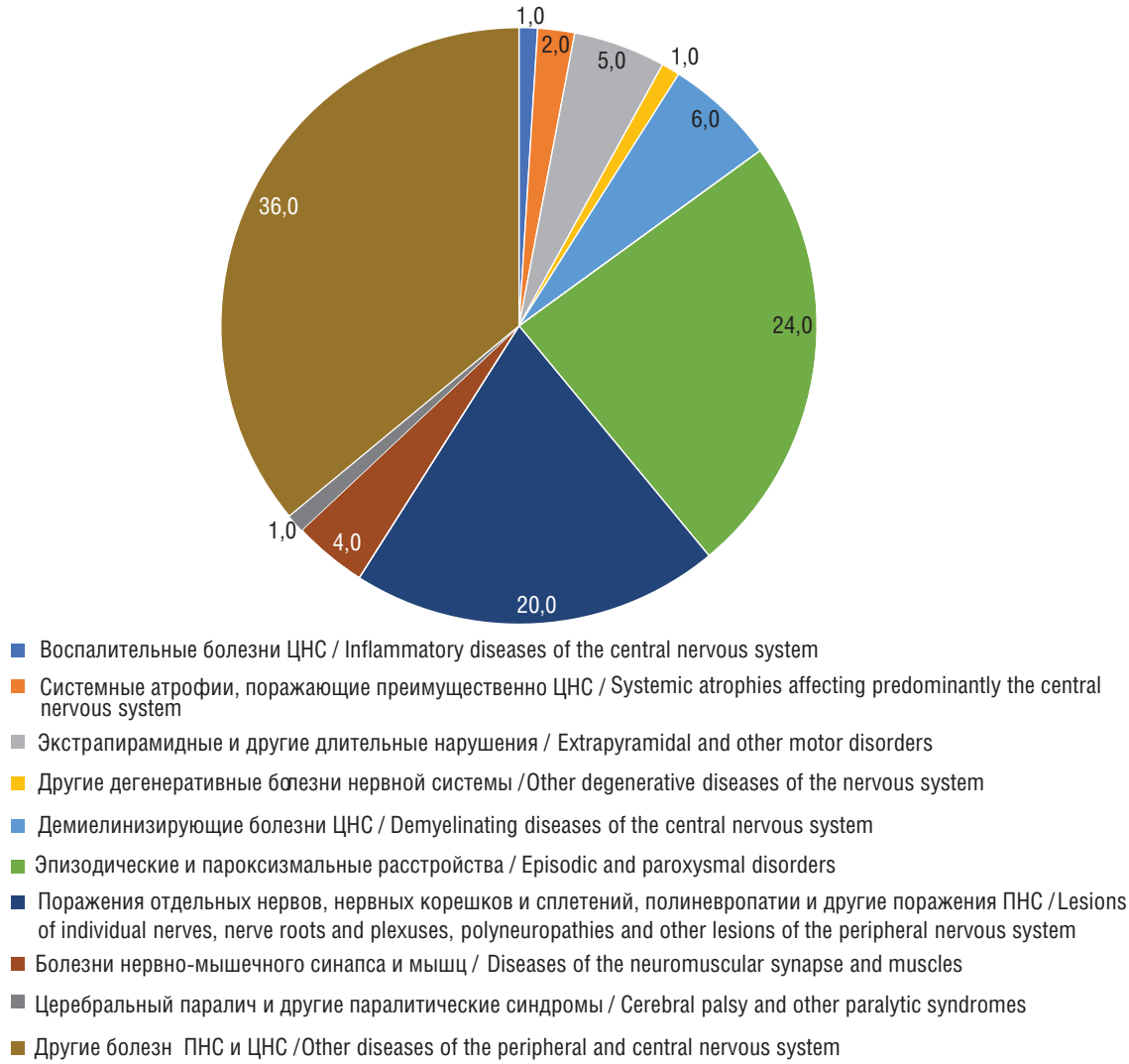

Fig. 3. Distribution of patients discharged from hospital by diagnosis (adults — 18 years and older), Saint Petersburg, 2021 (%)

Рис. 3. Распределение пациентов, выписанных из стационара, по диагнозам (взрослые — 18 лет и старше), Санкт-Петербург, 2021 г. (%)

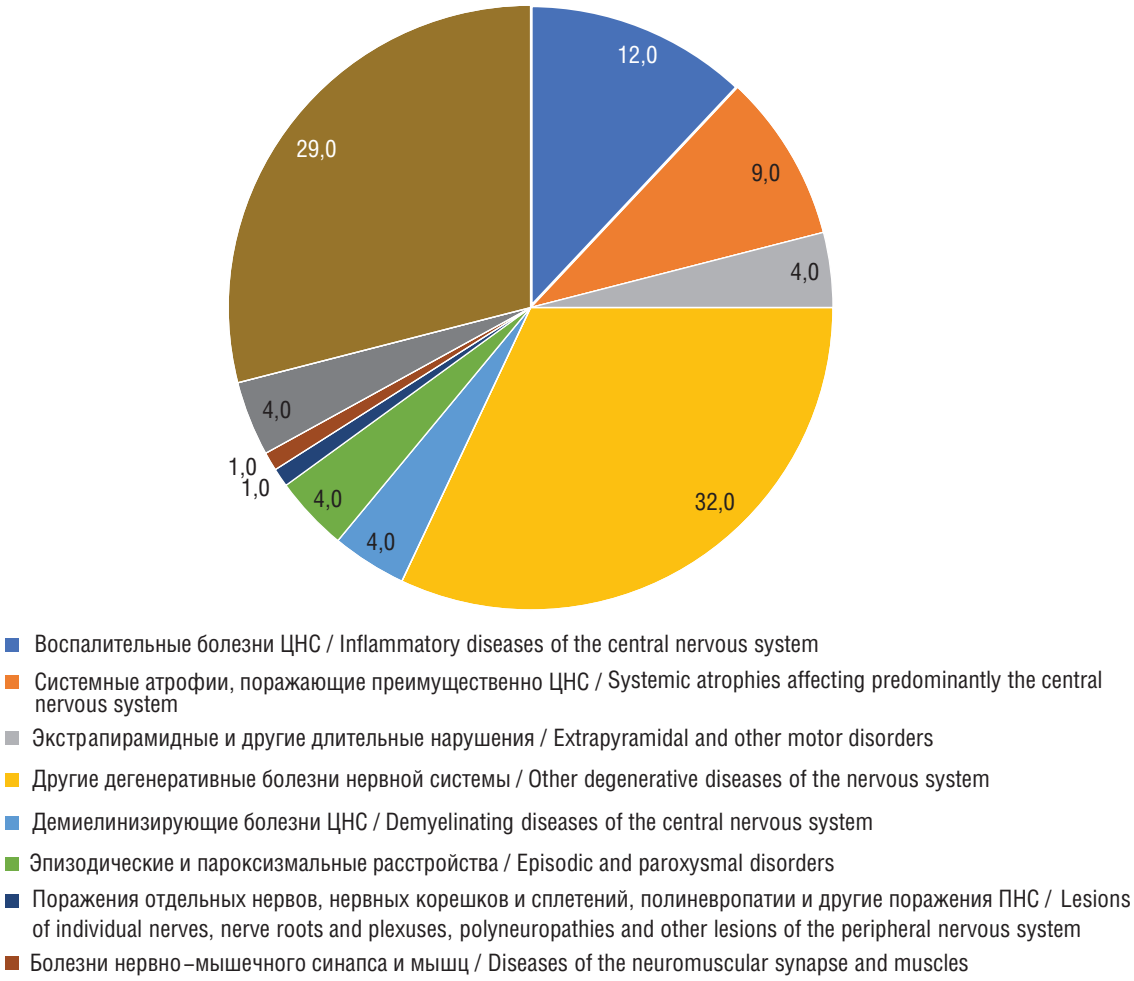

Fig. 4. Structure of mortality cases in neurosurgical departments (adults — 18 years and older), Saint Petersburg, 2021 (%)

Рис. 4. Структура летальности в отделениях нейрохирургического профиля (взрослые — 18 лет и старше), Санкт-Петербург, 2021 г. (%)

Table 4

Neurosurgical bed capacity for adults, Saint Petersburg, 2021 (%)

Таблица 4

Нейрохирургический коечный фонд для взрослых, Санкт-Петербург, 2021 г. (%)

Типы медицинских организаций / Types of medical organisations	**Койки для взрослых / Beds for adults**		**Среднегодовое количество коек / Average number of beds per year**	
	абс. / abs.	**относ. (%) / rel. (%)**	**абс. / abs.**	**относ. (%) / rel. (%)**
Всего в Санкт-Петербурге / Total in Saint Petersburg	385	100	340	100
МО КЗ / Medical organizations of the health committee	233	60,5	235	69,1
МО МЗ / Medical organizations of the Ministry of Health	152	39,5	105	30,9

Table 5

Neurosurgeons' of medical organization work in outpatient settings (adults — 18 years and older), Saint Petersburg, 2021 (%)

Таблица 5

Работа врачей-нейрохирургов медицинской организации в амбулаторных условиях (взрослые — 18 лет и старше), Санкт-Петербург, 2021 г. (%)

Типы медицинских организаций / Types of medical organisations	**Число посещений врачей, включая профилактические / Number of doctor visits, including preventive**		**Число посещений врачей по поводу заболеваний / Number of visits to doctors for illnesses**	
	1		**2**	
	абс. / abs.	**относ. (%) / rel. (%)**	**абс. / abs.**	**относ. (%) / rel. (%)**
Всего / Total	16 682	100	14155	84,9
МО КЗ / Medical organizations of the health committee	7090	42,5	5429	76,6
МО МЗ / Medical organizations of the Ministry of Health	9592	57,5	8726	91

Table 6

The level of medical examinations, Saint Petersburg, 2021 (%)

Таблица 6

Уровень диспансеризации, Санкт-Петербург, 2021 г. (%)

Всего зарегистрировано заболеваний нервной системы / Total registered diseases of the nervous system	**Взято под диспансерное наблюдение / Taken under dispensary observation**		**С впервые в жизни установленным диагнозом / With a first-time diagnosis**	
	абс. / abs.	**относ. (%) / rel. (%)**	**абс. / abs.**	**относ. (%) / rel. (%)**
278 983	64 145	23	29 387	11

Table 7

Personnel distribution in neurosurgical departments, Saint Petersburg, 2021 (%)

Таблица 7

Распределение кадров нейрохирургических отделений, Санкт-Петербург, 2021 г. (%)

Характеристика кадров нейрохирургических отделений / Characterization of the staff of neurosurgical departments	**Санкт-Петербург / Saint Petersburg**		**МО КЗ / Medical organizations of the Health Committee**		**МО МЗ / Medical organizations of the Ministry of Health**	
	штатных / staff	**занятых / accupied**	**штатных / staff**	**занятых / occupied**	**штатных / staff**	**занятых / occupied**
Число должностей в целом, ед. / Number of positions in total, units	338,8	283,0	245,8	194,8	93,0	88,3
Стационарная помощь, ед. / Inpatient care, units	333,8	279,3	242,0	191,8	91,8	87,5
Амбулаторная помощь, ед. / Ambulatory care, units	5,0	3,8	3,8	3,0	1,3	0,8
Число физических лиц основных работников на занятых должностях, человек / The number of physical persons out of the main employees in the occupied positions, people	242		168		74	

Table 8

Staffing of neurosurgical departments, Saint Petersburg, 2021 (%)

Таблица 8

Укомплектованность штатов нейрохирургических отделений, Санкт-Петербург, 2021 г. (%)

Условия оказания медицинской помощи / Conditions of medical care	**Санкт-Петербург / Saint Petersburg**	**МО КЗ / Medical organizations of the Health Committee**	**МО МЗ / Medical organizations of the Ministry of Health**
Всего / Total	83,5	79,3	94,9
Стационарная помощь / Inpatient care	83,7	79,2	95,4
Амбулаторная помощь / Ambulatory care	75	80	60

Table 9

Distribution of neurosurgeons by qualification characteristics, Saint Petersburg, 2021 (%)

Таблица 9

Распределение врачей-нейрохирургов по квалификационным характеристикам, Санкт-Петербург, 2021 г. (%)

Квалификационные характеристики / Qualification characteristics		**Санкт-Петербург / Saint Petersburg**		**МО КЗ / Medical organizations of the Health Committee**		**МО МЗ / Medical organizations of the Ministry of Health**	
		абс. / abs.	**относ. (%) / rel. (%)**	**абс. / abs.**	**относ. (%) / rel. (%)**	**абс. / abs.**	**относ. (%) / rel. (%)**
Всего врачей-нейрохирургов / Total number of neurosurgeons		242		168		74	
Из них: / Of these:							
Имеют сертификат специалиста / Have a specialist certificate		221	91,3	152	90,5	69	93,2
Имеют свидетельство об аккредитации / Have a certificate of accreditation		20	8,3	16	9,5	4	5,4
Имеют квалификационную категорию / Have a qualification category	Высшую / Superior	73	30,2	57	33,9	16	21,6
	Первую / First	32	13,2	21	12,5	11	14,9
	Вторую / Second	12	4,9	10	6	2	2,7
Не имеют квалификационной категории / Do not have a qualification category		125	51,7	80	47,6	45	60,8

DISCUSSION

Transport accidents were the main causes of morbidity and mortality among external causes (1.5%) in St. Petersburg in 2021. The main reason for hospitalization on neurosurgical wards was eye and eye socket trauma (ICD-10 code — S05), with intracranial trauma (ICD-10 code — S06) ranking second. The significance of traumatism in the structure of neurosurgical pathologies is confirmed by the data of other studies. Intracranial trauma accounted for the majority of external causes of death and hospitalization to neurosurgical beds in the Russian Federation in 2015–2017 [4, 9, 14, 17, 21]. A total of 321.1 thousand people were hospitalized with this pathology in 2015 and 305.0 thousand people in 2016. During the COVID-19 pandemic, there was an average of 12.8 hospitalizations for every head injury death in 2019 and 9.6 hospitalizations in 2020 [13].

The mortality rate at neurosurgical departments in St. Petersburg in 2021 amounted to 1.7%. Most of the patients were diagnosed with

degenerative diseases of the nervous system (ICD-10 code — G30-G31). Although the neurosurgical departments of St. Petersburg face difficult tasks — relatively high morbidity of the population with diseases of the nervous system and a variety of nosological forms of diseases — it can be concluded, based on the low mortality rate in the city, that neurosurgical care is rendered in an adequate volume [3, 10, 12, 26]. The same is true for the post-Covid period: in 2019, the hospital-wide mortality rate among neurosurgical patients in the Russian Federation was 1.2%, in 2020 — 1.4% [13]. The high mortality of patients with degenerative diseases of the nervous system in St. Petersburg may be related, on the one hand, to their significant prevalence due to the difficulty of early diagnosis of diseases and the impossibility of their complete cure, and, on the other hand, to the increase in the elderly population, mostly affected by these diseases. In addition, it is already known that coronavirus infection caused by the SARS-CoV-2 virus, in addition to affecting the respiratory system, can lead to involvement of the nervous system, which undoubtedly causes decompensation of patients' existing conditions and possibly influences the development of new disorders [1, 7].

According to the Letter of the Russian Ministry of Health of 2019, the average duration of a patient's stay on a neurosurgical unit should not exceed 10.7 days [20]. In St. Petersburg, it amounted to 8.8 days.

Due to the development of hospital substitution technologies, the total bed capacity is decreasing [21]. It might be also applied to the neurosurgical service [17, 24]. In 2016, compared to 2014, the total number of neurosurgical beds decreased by 4.6%. Taking into account the population, the level of availability of neurosurgical beds in the Russian Federation averaged 9.49 and 9.01 beds per 100,000 population in 2014 and 2016, respectively [24]. The situation did not change during the COVID-19 pandemic: compared to 2019, the number of beds decreased by 18% in 2020, and the availability of neurosurgical beds in 2020 was 7.28 beds per 100,000 population [13]. In addition, neurosurgical beds are extremely unevenly distributed across individual regions: according to 2016–2020 data, half of the country's total neurosurgical bed stock was concentrated in 15 constituent entities of Russia. The largest number of specialized beds was deployed in Moscow, St. Petersburg, the Sverdlovsk and Samara Regions, and the Republic of Bashkortostan [13, 24]. If we analyze St. Petersburg and the Leningrad Region separately, in 2016–2020, as already noted, St. Petersburg appeared on the list of the regions which were most provided with specialized beds, while the Leningrad Region was undersupplied with neurosurgical beds [13, 24]. In 2021, there were 385 adult specialized beds in St. Petersburg with a bed capacity of 9.90/0000, which is considered sufficient [6, 17, 28]. However, the average duration of bed occupancy exceeds 340 days and the inpatient capacity is over 100% — this indicates that the city's inpatient facilities were overloaded [6, 10, 12, 16, 28]. The average annual neurosurgical bed occupancy in St. Petersburg was higher compared to data for the Russian Federation both before the COVID-19 pandemic (257.7±90.8 days in 2019) and after it (312.9±130.8 days in 2020) [13].

In 2021, the coverage by neurosurgeons in St. Petersburg was unsatisfactory, while the compatibility ratio was rather low (1:1.2) [2, 3]. However, it is worth noting that there is an upward trend in the number of staff positions of neurosurgeons and the number of physicians in Russia for 2015–2020, which increased by 7.5 and 8.1%, respectively [13, 24]. The outpatient neurosurgical care of St. Petersburg is underdeveloped [2, 3, 5, 25, 26]. Despite the high percentage of regular medical follow-ups and consultations for neurosurgical diseases, the staffing level of the outpatient neurosurgical service was only 75%.

As for outpatient settings, primary pre-hospital medical and sanitary care is provided by paramedics and other medical workers with secondary medical education, whereas primary medical and sanitary care is carried out by general practitioners, district general practitioners, family physicians, and neurologists [18]. In this connection, in order to improve the quality of early diagnosis of neurosurgical patients, it is advisable to preserve and develop the human resources potential of the outpatient unit by providing continuous postgraduate training in neurosurgery for the above specialists, attracting more neurosurgeons to outpatient units and introducing highly informative methods of examination of patients in a consulting room of a neurosurgeon. Promotion of rehabilitation measures may become a prospect for the deve-

lopment of outpatient care. In order to improve the efficiency of dynamic follow-up of patients at the third stage, it is necessary to reconsider the possible ways of interaction between a consultative and hospital neurosurgical service. This should be done through detailed development of neurosurgical patients' selection for the second stage of rehabilitation and their early transfer to the third stage, adherence to a multidisciplinary approach at the outpatient stage of rehabilitation treatment, expansion of the equipment of physical therapy rooms in outpatient clinics, and competent assessment of therapy results.

Worryingly, more than half of neurosurgeons had no qualifications [2, 10, 23]. Over 8% of specialists were not certified at the time of the study, although the presence of a specialist certificate is one of the obligatory conditions for admission to work [23, 24].

CONCLUSION

At the end of 2021, the overall incidence of nervous system pathology (ICD-10 code — G00-G98) in St. Petersburg amounted to 51.9 per 1 thousand people; primary morbidity is 5.5 per 1 thousand people. Episodic and paroxysmal disorders (ICD-10 code — G40–G47) accounted for the majority in discharged patients.

There are a number of positive aspects in neurosurgical care organization: availability of neurosurgical beds for adults is higher than the national average, the inpatient mortality rate is low, and the percentage of patients undergoing medical examination is high. At the same time, the beds are overloaded and neurosurgical care in outpatient settings is poorly developed. The activity of the service is ensured by qualified specialists, but 51% of doctors have not been certified; the staffing of doctors is only 83.5%.

The identified shortcomings determine the directions for further improvement of specialized neurosurgical care.

ADDITIONAL INFORMATION

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PECULIAR FEATURES OF CONSUMER PROTECTION IN THE REMOTE METHOD OF SELLING GOODS

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ABSTRACT. In recent years, both in the world and in Russia, high rates of growth in the volume of online commerce have been noted, which indicates a shift in consumer preferences towards a gradual increase in purchases in online stores and a certain reduction in the purchase of goods in traditional retail chains. The article analyzes the number and subject of citizens' appeals, which shows that the work carried out in the Department of Rospotrebnadzor in the Leningrad region serves to identify the causes of violation of the rights and interests of citizens, to study public opinion, to improve the work of the organization. An increase in the number (from 18.72 to 38.46%) of complaints regarding violations of consumer rights to FDT was noted, while the number of inspections carried out at FDT was relatively small. The analysis of informing consumers and entrepreneurs according to the data taken from the official websites of the Departments of the subjects of Rospotrebnadzor in the Northwestern Federal District allows to conclude that information on the means to protect citizens, issues of clarifying legislation in the field of distance trading does not allow to sufficiently increase the level of consumer literacy. As part of the study, we conducted a questionnaire to assess the quality and demand for remote purchase of goods by the population, as well as to identify problems faced by citizens when receiving services. 42% of respondents noted that the purchased goods were of poor quality. 55.7% reported refund of the goods. Only 3.3% of respondents applied to Rospotrebnadzor for help in a conflict situation. 64.3% of respondents noted that there is "too much information difficult to understand". These studies allowed us to formulate recommendations for solving problems related to consumer protection in the FDT: to create a specialized Internet resource to improve digital literacy of consumers, to make a proposal to improve the State Information Resource on consumer Protection, the need for timely coverage of topical issues of consumer protection in the field of FDT on the official websites of the departments of Rospotrebnadzor.

KEY WORDS: consumer protection; online purchases; refund of goods; Rospotrebnadzor; informing the public.

ОСОБЕННОСТИ ЗАЩИТЫ ПРАВ ПОТРЕБИТЕЛЕЙ ПРИ ДИСТАНЦИОННОМ СПОСОБЕ ПРОДАЖИ ТОВАРОВ

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РЕЗЮМЕ. В последние годы и в мире, и в России отмечены высокие темпы прироста показателей объема интернет-торговли, которые свидетельствуют об изменении потребительских предпочтений в сторону постепенного увеличения покупок в интернет-магазинах и сокращении приобретения товаров в традиционных торговых сетях. В статье проведен анализ количества и тематики обращений граждан, который показывает, что проводимая в Управлении Роспотребнадзора по Ленинградской области работа служит выявлению причин, вызывающих нарушение прав и интересов граждан, изучению общественного мнения, совершенствованию работы организации. Отмечено увеличение количества (с 18,72 до 38,46%) обращений по вопросам нарушения прав потребителей в сфере дистанционной торговли (СДТ), при этом количество проводимых проверок в СДТ было невелико. Анализ информирования потребителей и предпринимателей по данным с официальных сайтов Управлений субъектов Роспотребнадзора по Северо-Западному федеральному округу позволяет сделать вывод, что объем информации о способах защиты граждан, вопросам разъяснения законодательства в СДТ не позволяет в достаточной мере повысить уровень потребительской грамотности. В рамках исследования нами было проведено анкетирование для оценки качества и востребованности дистанционной покупки товаров населением, а также для выявления проблем, с которыми сталкиваются граждане при получении услуги. 42% опрошенных отмечали, что приобретаемые товары были некачественными, 55,7% сообщили, что возвращали товар. Только 3,3% респондентов обращались в Роспотребнадзор за помощью в конфликтной ситуации. 64,3% респондентов отметили, что информации «слишком много, сложно разобраться». Данные исследования позволили нам сформулировать рекомендации для решения проблем по вопросам защиты прав потребителей в СДТ: создать специализированный интернет-ресурс по повышению цифровой грамотности потребителей, внести предложение об усовершенствовании Государственного информационного ресурса по защите прав потребителей, своевременно освещать актуальные вопросы защиты прав потребителей в СДТ на официальных сайтах управлений Роспотребнадзора.

КЛЮЧЕВЫЕ СЛОВА: защита прав потребителей; покупки в Интернете; возврат товаров; Роспотребнадзор; информирование населения.

INTRODUCTION

Population health is an integral indicator of the quality of life in its objective manifestations. It reflects biological, demographic and social processes of society. Social and economic factors (standard of living, security and income of the population) play a leading role

in influencing the health of the population. The impact of these factors is estimated at 30–40% [6, 10]. Distance selling of goods carries an increased risk of purchasing low-quality goods by consumers, which creates a threat of harm to the life and health of citizens. Remote purchasing of products requires additional protection of a consumer, since he acts as a weak side of a deal [7]. Consumers might suffer both from material losses, and find themselves hostages of the situation. Currently, business entities are seeking to use various options for online sale of goods and provision of services to expand their activities in all possible spheres. A similar trend is observed in the market of medical devices and pharmaceuticals through Internet pharmacies. This phenomenon is uncontrollable and ambiguous, because [8] remote selling often provides consumers with low-quality or falsified goods. Unfortunately, there is no single federal law that would regulate their circulation at the moment. These circumstances allow us to conclude the importance of further development of legal regulation of public relations related to the implementation of distance selling of goods and remote ways of rendering services [2]. Due to the lack of time, the current system of normative-legal acts is not able to fully regulate various relations in the field of distance trade (FDT) of goods and services. Changes made to legislative and other normative legal acts do not provide a timely response to exiting problems in the field [6, 8]. Analysis of citizens' appeals concerning remote selling of goods and informing the population will allow to identify pressing problems in this segment of trade.

AIM

To identify problems of consumer protection in the field of distance trade (FDT) by analyzing citizens' appeals, informing the population and offering recommendations for their solution.

OBJECTIVES

1. To analyze the system of regulatory and legal acts in FDT.
2. To analyze citizens' appeals in FDT according to the data of the Department of Rospotrebnadzor for the Leningrad Region.
3. To analyze the information for consumers provided on official websites of the territorial authorities of Rospotrebnadzor in the North-West Federal District (NWFD).
4. To conduct a questionnaire survey of the population concerning FDT.
5. To develop recommendations for improving consumer protection activities of Rospotrebnadzor in relation to FDT.

MATERIALS AND METHODS

There have been analyzed following documents: normative-legal acts in the field of consumer protection concerning distant trade (DT), the results of Rospotrebnadzor Departments' activities in the North-West Federal District in the field of consumer protection of DT, the results of questionnaire survey of the population by means of Google-form. 300 respondents took part in the survey: 185 women (61.7%) and 115 men (37.3%). 204 (68 %) were working, 42 (14%) were studying and working, 40 (13.3%) were not working, 14 (4.7%) were studying. Respondents were selected by flow sampling method [1].

RESULTS AND DISCUSSION

The system of normative and legal acts in FDT includes the Law of the Russian Federation dated 7 February 1992 N 2300-1 "On Protection of Consumer Rights" and the Decree of the Government of the Russian Federation dated 31 December 2020 N 2463 "On Approval the Rules for the sale of goods under a retail sale agreement, the list of durable goods, which are not covered by the consumer's demand for free provision of goods with the same basic consumer properties, for the period of repair or replacement of such goods and the list of non-food goods of proper quality, which are not subject to the repair or replacement of such goods" [3, 7, 9]. There are certain gaps in terms of FDT legal regulation, especially in the field of turnover of goods on the Internet. They include the lack of uniform rules for the electronic commerce market, the need to form a simplified system of dispute resolution between participants of distance commerce, the lack of a legally enshrined concept of electronic contract [2, 4]. According to State reports on consumer rights protection in the Russian Federation, there is a growing number of citizens' appeals to territorial bodies of Rospotrebnadzor regarding retail trade and DT in particular. The share of appeals on DT has increased 4 times in 5 years (Table 1).

Table 1

The number of appeals, received by territorial administrations , inspections carried out and violations detected in the SDT in 2016–2020

Таблица 1

Количество обращений, поступивших в территориальные управления, проведенных проверок и выявленных нарушений в СДТ в 2016–2020 годах

Количество обращений, проведенных проверок, выявленных нарушений / The number of appeals, inspections carried out and violations detected	**2016 г.**	**2017 г.**	**2018 г.**	**2019 г.**	**2020 г.**
Общее количество обращений / The total number of requests	332 179	322 862	326 369	368 980	431 040
из них по розничной торговле / out of them for retail trade	146 196	134 719	136 839	157 985	167 192
из них по ДТ / of these, DT	8774	11 649	16 174	24 624	37 534
% обращений по ДТ / % of requests for DT	6	9	11,8	15,6	22,4
Проведено проверок по ДТ / Checks on DT carried out	290	72	85	355	47
Выявлено нарушений по ДТ / Violations of DT revealed	822	562	663	620	290

Примечание: ДТ — дистанционная торговля.
Note: DT — distance trading.

Table 2

The number of appeals received by the territorial Department of Rospotrebnadzor in the Leningrad region, inspections carried out and violations detected in the sphere of distance trading in 2019–2021

Таблица 2

Количество обращений, поступивших в территориальные управления Роспотребнадзора по Ленинградской области, проведенных проверок и выявленных нарушений в сфере дистанционной торговли в 2019–2021 годах

Количество обращений, проведенных проверок, выявленных нарушений / The number of appeals, inspections carried out and violations detected	**2019 г.**	**2020 г.**	**2021 г.**
Обращения о нарушениях прав потребителей / Complaints about consumers' rights violations	4077	5399	6757
Из них по розничной торговле / Of these, by retail trade	2596	2708	3894
Из них по ДТ / Of these DT	486	714	1498
% обращений по ДТ / % of requests for DT	18,72	26,37	38,46
Проведено проверок по ДТ / Checks on DT carried out	12	0	7
Выявлено нарушений по ДТ / Violations of DT revealed	36	0	56

Примечание: ДТ — дистанционная торговля.
Note: DT — distance trading.

In 2020, an overall decline in consumer activity and retail trade has led to emergence of problems that require the development of mechanisms to protect economic interests of consumers: trading in social networks, related online services, dangerous transactions, dubious content, etc. The structure of appeals was determined by such behavioral risk factors as distance shopping, online transfers [5, 8].

The research has analyzed the number of appeals received by the Department of Rospotrebnadzor for the Leningrad Region (LR)

regarding violations of consumer rights as well as the number of inspections from 2019 to 2021 (Table 2).

The number of conducted inspections was low when the number of appeals concerning violation of consumer rights in FDT increased from 18.72 to 38.46%. This is explained by the moratorium on their conduct, as well as by regulation of disputes involving the Rospotrebnadzor in the pre-trial order through consultations, sending requests and explanations to the controlled parties. The structure of citizens' appeals is presented in Table 3. The main reasons for consumer appeals in the Leningrad Region in FDT include:

- selling goods of inadequate quality;
- violation of transfer terms of pre-paid goods;
- refusal to return goods of proper quality, which are technically complex goods;
- lack of information about a seller, impossibility to file a claim;
- misleading a consumer about consumer properties of goods;
- failure to provide information on safety of purchased goods by a seller;
- failure to consider consumer's claims;
- failure to return (avoidance of returning) money paid by a consumer;
- refusal to reimburse consumers for losses (penalties).

Studying the activities of territorial bodies of Rospotrebnadzor in the North-West Federal District, it was revealed that there were shortcomings in informing the population about the protection of consumer rights in distance trade. The data are presented in Table 4.

The greatest number of materials on safe DT, brochures and leaflets concerning DT and fraud in this sphere were published by the Rospotrebnadzor offices in the Republic of Karelia, the Komi Republic and the city of St. Petersburg. Information work on the Internet is not carried out in the Arkhangelsk, Kaliningrad, Murmansk and Pskov regions. The materials provided on the websites of the Rospotrebnadzor include brochures on peculiarities of online shopping, social networks, consumer rights when purchasing goods remotely, safe DT, and fraud. Consumers are informed about ways to protect their rights through Cyber Day and Black Friday campaigns. Awareness of the population of the North-West Federal District on DT issues is insufficient.

300 people participated in the questionnaire survey. The age composition of the participants is presented in Table 5.

The results of the population questionnaire showed that 287 people (95.7%) combine online and offline shopping. 186 (62%) often purchase goods remotely, 114 people (38%) do it rarely. 216 people (72%) said their online purchases have increased since the pandemic had begun. Meanwhile, 67 people (22.3%) make spontaneous purchases often, 109 (36.3%) — rarely, while 124 people (41.33%) do not make spontaneous purchases at all.

According to respondents, the most preferred aggregators were Ozon — 229 votes (76.3%), Wildberries — 166 votes (55.3%), AliExpress — 105 votes (35.0%). Among the

Table 3

Structure of appeals on distance trading to the Department of Rospotrebnadzor in the Leningrad region in the period from 2019 to 2021

Таблица 3

Структура обращений по дистанционной торговле в Управление Роспотребнадзора по Ленинградской области в период с 2019 по 2021 годы

Структура выявляемых нарушений / Structure of detected violations	**2019 г.**	**2020 г.**	**2021 г.**
Выявлено нарушений в сфере дистанционной торговли / Violations in the field of distance trading revealed	36	0	56
Из них Закона «О защите прав потребителей» / Of these, the Law «On Consumer Protection»	12	0	27
В том числе по статьям 8–10, 12 / Including articles 8–10, 12	4	0	10
В том числе по статье 16 / Including articles 16	2	0	5
Другие статьи Закона «О защите прав потребителей» / Other articles of the Law «On Consumer Protection»	6	0	12
Иные нормативно-правовые акты / Other regulatory legal acts	24	0	29

Table 4

Analysis of information posted on the official websites of Rospotrebnadzor Departments by subjects in the NWFD for the period 2018–2020

Таблица 4

Анализ информации на официальных сайтах управлений Роспотребнадзора в СЗФО за период 2018–2020 гг.

Субъект / Subject	Итоги работы / Results of work	Судебная практика / Judicial practice	«Горячие линии» / «Hot lines»	Консультации, разъяснения / Consultations, explanations	Брошюры / Brochures
Архангельская область / Arkhangelsk region	4	–	–	1	1
Вологодская область / Vologodskaya region	4	4	–	5	3
Калининградская область / Kaliningrad Region	4	–	–	–	–
Ленинградская область / Leningrad Region	4	2	–	2	3
Мурманская область / Murmansk region	4	–	1	1	–
Новгородская область / Novgorodskaya region	6	1	1	3	3
Псковская область / Pskovskaya region	4	3	1	–	1
Республика Карелия / Republic of Karelia	8	4	3	4	10
Республика Коми / Komi Republic	8	9	2	3	10
Ненецкий АО / Nenets Autonomous District	2	1	–	3	4
Санкт-Петербург / Saint Petersburg	11	2	8	18	42

Table 5

Age group of respondents taking part in the survey

Таблица 5

Возрастной контингент респондентов, принимавших участие в анкетировании

Возраст респондентов / Age of respondents					
16–24	25–34	35–44	45–54	55–64	65 и старше / 65 and older
41	95	81	46	31	6

criteria for choosing online shops were: affordable prices — 204 votes (68%), advice from family and friends — 141 votes (47%), positive reviews — 140 votes (46.6%), preference for a popular brand — 100 votes (33.3%), online advertising — 45 votes (15%) and other reasons — 53 votes (17.6%).

The range of goods purchased remotely is gradually expanding. For example, respondents noted such categories as clothes — 199 (66.3%), personal care products — 160 (53.3%), household appliances — 152 (50.6%), entertainment goods — 105 (35%), groceries — 98 (32.6%), medicines — 76 (25.3%), other goods — 168 (56%). At the same time, certificates of conformity for goods are requested by only 15 people (5%) and 36 people (12%) ask for certificates for certain goods. 249 people (83%) answered this question negatively, and some explained that had heard about this option for the first time.

126 respondents (42%) had purchased goods that appeared to be inappropriate in terms of quality and expiry dates. 167 (55.7%) returned goods purchased in online shops due to their improper quality, non-compliance of goods with the stated characteristics, inappropriate size/fashion, color. Despite certain problems arising when making purchases remotely, 98 people (32.7%) said that they "often" and 94 people (31.3%) said that they "always" solved them on their own. 17 people (5.7%) indicated that they "never" managed to resolve conflict situations. Only 10 people (3.3%) reported that they had applied to Rospotrebnadzor. 115 (38.33%) of respondents found information about DT "available", 49 (16.33%) — "not available", 136 (45.33%) — "available but not clear". According to the survey, there was "too little open information, not everything had answers" for 134 (44.67%), "enough" for 59 (19.67%), "too much, difficult to understand" for 193 (64.33%). The majority of the respondents, 271 (90.3%), believe that additional information of consumers in the field of protection of their rights is necessary. In the course of the survey, the respondents were also offered to use the State Information Resource in the sphere of consumer protection to search for necessary information on distance trade issues, and 236 people (78.66%) replied that this platform is "inconvenient to use", "it is difficult to find the necessary information, inconvenient search", "there is no separate section on distant trade".

CONCLUSION AND RECOMMENDATIONS

- Since 2016, there has been an increase in citizens' appeals on distance selling, the structure of appeals and the main violations have been established.
- Awareness of the population of the North-West Federal District on distant trade issues is insufficient.
- Consumers often face problems in the sphere of e-commerce and need to improve the level of consumer knowledge.

The following recommendations are offered:

1. To create a specialized online resource to improve consumers' digital competence, skills in searching for product information and its correct evaluation, awareness of choice when making online purchases and protection from online threats.
2. To make a proposal to improve the State information resource on consumer protection by allocating a separate section "Distant trade", with the ability to quickly find information, to ensure regular updating of the resource with relevant materials on the topic.
3. To timely highlight topical issues of consumer protection in FDT on official websites of Rospotrebnadzor.
4. To consider the possibility of organizing regular lectures, recording video clips to improve the legal competence of the population, creating "Schools of competent consumer" by Rospotrebnadzor, Centers of Hygiene and Epidemiology and public associations.

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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UNIVERSAL GENIUS OF THE CENTRAL ASIAN RENAISSANCE (TO THE 1050TH ANNIVERSARY OF ABU RAYKHAN AL-BERUNI)

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ABSTRACT. The article reveals the significance of the activities of the great scientist of the Central Asian Renaissance, Abu Rayhan Beruni (973–1048), whose anniversary is being widely celebrated in 2023 around the world. The phenomenon of the Renaissance itself proved to be unique, being characterized by a humanistic orientation and an unprecedented prosperity of science, philosophy, medicine, and education. Al-Beruni belonged to a galaxy of outstanding thinkers of that time, such as al-Farghani, al-Khorezmi, al-Farabi, Ibn Sina, etc., and was an encyclopedist whose interests extended to literally all spheres of knowledge. Al-Beruni's advanced methodology of scientific knowledge and his development of the empirical inductive method of knowledge enriched philosophy. He was familiar with the works of the great representatives of Greek philosophy and science: pre-Socratic natural philosophers, Plato, Aristotle, Ptolemy, Euclid, Neoplatonists and Neo-Pythagoreans, with the works of Indian, Byzantine and Muslim scientists, as evidenced by comments, explanations, judgments and polemics with fellow scientists in his works. As a natural philosopher, he had a deistic view of the universe. Al-Beruni was one of the thinkers who stood at the origins of comparative religious studies. Analyzing religious teachings, he undoubtedly gave preference to Islam and noted its superiority, however, we can admit his deep knowledge of other religions, the desire to understand them rather than prove them wrong, and to express admiration for other cultures. His thought was characterized by scientific objectivity and accuracy of observations. Al-Beruni's writings also reflected ideas about morality. He drew attention to the need to develop such qualities as honor, dignity, friendship, partnership, conscience, and justice.

KEY WORDS: Central Asian Renaissance; Abu Rayhan Beruni; Mamun Academy; philosophy; Beruni cognitive method; religious studies; spiritual and moral education.

УНИВЕРСАЛЬНЫЙ ГЕНИЙ ЦЕНТРАЛЬНО-АЗИАТСКОГО ВОЗРОЖДЕНИЯ (К 1050-ЛЕТНЕМУ ЮБИЛЕЮ АБУ РАЙХАНА АЛЬ-БЕРУНИ)

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РЕЗЮМЕ. В статье раскрывается значение деятельности великого ученого центрально-азиатского Возрождения Абу Райхана Беруни (973–1048), чей юбилей широко отмечается в 2023 году по всему миру. Феномен центрально-азиатского Возрождения был уникальным явлением, характеризовавшимся гуманистической направленностью и небывалым расцветом науки, философии, медицины, просвещения. Аль-Беруни принадлежал к плеяде выдающихся мыслителей того времени, таких как аль-Фергани, аль-Хорезми, аль-Фараби, Ибн Сина и других, и был ученым-энциклопедистом, интересы которого распространялись буквально на все сферы знания. Передовая методология научного познания аль-Беруни, разработка им эмпирического индуктивного метода познания обогатили философию. Он был знаком с трудами великих представителей греческой философии и науки: досократических натурфилософов, Платона, Аристотеля, Птолемея, Евклида, неоплатоников и неопифагорейцев, с работами индийских, византийских и мусульманских ученых, о чем свидетельствуют комментарии, разъяснения, суждения и полемика с коллегами-учеными в его работах. Как натурфилософ, он склонялся к деистическому взгляду на мироздание. Аль-Беруни был одним из мыслителей, стоявших у истоков сравнительного религиоведения. Анализируя религиозные учения, он, несомненно, отдавал предпочтение исламу и отмечал его превосходство, однако надо признать глубокое знание им других религий, стремление скорее понять их, чем доказать неправоту, выразить восхищение другими культурами. Его мысль характеризовалась научной объективностью и меткостью наблюдений. В сочинениях аль-Беруни также нашли отражение представления о нравственности. Он обращал внимание на необходимость развития таких качеств, как честь, достоинство, дружба, товарищество, совесть, справедливость.

КЛЮЧЕВЫЕ СЛОВА: центрально-азиатское Возрождение; Абу Райхан Беруни; академия Мамуна; философия; метод познания Беруни; религиоведение; духовно-нравственное воспитание.

Abu Rayhan Muhammad ibn Ahmad Beruni (973–1048) was a great medieval encyclopaedist and humanist who left his intellectual mark in astronomy, mathematics, philosophy, geography, ethnography, anthropology, geology, botany, medicine, pharmacology and many other sciences (Fig. 1). He was an outstanding cross-cultural historian who researched the traditions, morals, and religions of different peoples.

His scholarly horizons are truly immense. Al-Beruni's scientific legacy (about 150 works) touches almost all branches of the exact, natural and human sciences of his time. His works, which were translated into German, English, Russian and other languages, are still relevant today. The 1050th anniversary of Al-Beruni is being widely commemorated in 2022–2023 in many countries according to UNESCO's decision. Events dedicated to the anniversary (symposia, conferences, scientific round tables and student Olympiads) are held not only in Uzbekistan, the scientist's homeland, but also in Iran, Tajikistan and Turkey, where the memory of the great scientist is particularly cherished. Numerous scientific events dedicated to the remarkable date discuss the role of Beruni's scientific heritage and creativity in the development of world science, and emphasize the importance of studying the scientist's works and historical sources. An international scientific symposium entitled "Abu Rayhan Beruni — Discoverer of the Mysteries of Nature" was held in Tajikistan (Dushanbe) on 9 and 10 October 2023 in cooperation with UNESCO. In September 2023, an In-

Fig. 1. Abu Rayhan Beruni

Рис. 1. Абу Райхан Беруни

ternational Scientific and Practical Conference on 'The Role of the Scientific Heritage of Abu Rayhan Beruni in the Development of World Science' was held in the Republic of Uzbekistan (Tashkent). The range of issues discussed here testifies to multifaceted nature of al-Beruni's genius. The following topics were considered: "The role of applied sciences in the scientific heritage of Abu Rayhan Beruni", "Abu Rayhan Beruni and social and humanitarian sciences", "Modern approaches to the scientific heritage of Abu Rayhan Beruni", "Contribution of Abu Rayhan Beruni to the development of world civilization" and many other issues related to the life and work of the famous scientist. Our university was not left aside from such a significant scientific event and presented a report on "The relevance of Abu Rayhan Beruni's heritage in the humanitarian education of students of St. Petersburg State Paediatric Medical University (SPbSPMU)".

Abu Rayhan al-Beruni was a representative of the Central Asian Renaissance of the IX–XIII centuries, a historical phenomenon which was center in modern Uzbekistan. Its center was the historical and cultural region of Maverannahr and Khorezm, characterized by the intensity of intellectual life and the depth of intercultural ties, in particular, since ancient times Khorezm had trade relations with Kievan Rus, the Volga region and other countries [8]. It was a time of unprecedented cultural growth, flourishing of science, philosophy and enlightenment, which gave the world a whole pleiad of outstanding thinkers, such as al-Ferghani, al-Khwarizmi, al-Farabi, Ibn Sina, Omar Khayyam, Mirza Ulugbek, al-Rumi, Navoi and others. One of the representatives of this Pleiad was Abu Rayhan Beruni, a great scientist from Khorezm, who mastered almost all sciences of his time.

The largest educational institutions in the land of Uzbekistan — Mamun's Khorezm Academy (XI century) and Ulugbek's Samarkand Academy (XV century) — played a huge role in the development of culture at that time. In 1004, the enlightened ruler of Khorezm, Shah Ali ibn Mamun invited al-Beruni to participate in the organization of the academy. His contribution to Mamun's academy was significant, as he headed it throughout the years of its existence until 1017 and was the organizer and active participant of institution's scientific works. In addition, al-Beruni was both the organizer of the scientific work of the Academy and took an active part in researches himself. Many scholars from different countries were also invited here, thus creating an effective model of scientific community called "Mamun's Academy". The environment for scientific work created in the Gurgaj Academy encouraged scientists to write brilliant works in various fields of science. Among those attracted to the Academy was Abu Ali ibn Sina (Avicenna, 980–1037). His philosophical, natural-scientific and medical views were formed here, and this is where he began to create his famous work "Canon of Medical Science". Observations and ideas of the Academy's scientists nourished science all over the world for centuries to come. Mamun Academy's motto — "Science for the benefit of people", confirms the humanistic orientation of the scientists' research.

While working at the Mamun Academy, al-Beruni had a scientific polemic with Ibn Sina on the structure of the universe. As a result of this polemic, al-Beruni questioned the Aristotelian doctrine of the existence of the heavenly world and criticized the idealistic elements of Aristotle's natural philosophy. This correspondence, as well as other works of al-Beruni, testify to versatility of the great scientist from Khorezm.

Beruni is called the founder of geodesy and geology, a profound mathematician and astronomer, and a geographer. For the first time in the Middle East, al-Beruni expressed an opinion about the possibility of the Earth's movement around the Sun and determined the length of the Earth's circumference.

Al-Beruni's contribution to medicine is also significant. His unfinished work "Pharmacognosy in Medicine", a book on medical remedies, which he began writing at the end of his life (1046–1048), is very interesting. This capital work is extremely important even in our time. The work described in detail more than a thousand medicinal plants and about 880 herbal remedies. The book contains information not only about medicinal properties of various substances, but also ways of preparing medicines from plants, animal organs and minerals. Al-Beruni also contributed to establishment, formation and harmonization of medical terminology. He collected and explained about 4500 Arabic, Greek, Syriac, Indian, Persian, Khorezmian, Sogdian, Turkic and other names of plants; these synonyms are important for the modern study of the history of pharmacognosy. In another work named "Minerology", al-Beruni showed the effectiveness of moomiyo (shilajit) for treating wounds and skin diseases. His recommendations regarding moomiyo were widely used by physicians of that time and subsequent periods.

Al-Beruni's philosophical views are also interesting. The scientist lived in the period when the Arab-Muslim culture flourished in Central Asia, and Arab philosophy was actively developping (Arabic — falsafa). There was a "combination of Abrahamic, Judeo-Christian-Muslim relativism (from the Latin revelatio — revelation) with ancient pagan intellectualism, which later inspired the classics of Jewish and Christian theology, such as Maimonides (d. 1204) and Thomas Aquinas (d. 1274)" [5]. This was the "golden age" of Islamic mathematics and natural science. The natural scientific picture of the world began to form during that time under the influence of the naturalistic philosophy of the Greeks. "During the period of the highest blossoming of science (IX–XI centuries), Arab philosophers and scientists proceeded in their research, like the Greeks, from the principle of the unity of nature and the integrity of science'' [9]. While Western European scholasticism was steadily moving towards more and more abstract theorizing and detachment from empirical reality, science in the East managed to avoid the acute conflict between abstract theoretical systems and cognizable reality. Scientists of medieval East realized the importance of empirical cognition without absolutizing it, they never forgot that in order to comprehend the essence of phenomena, their connections and interactions, it was necessary to move to a higher level of scientific cognition, namely theoretical and metaphysical ones. Science is "a certain way of being, which requires existential conditions and prerequisites" [4]. Scientists in the East had a splendidly organized educational system (Mamun's academy). Thus, they managed to create a scientific entity much earlier than scientists in Western Europe. Here a number of individual elements (experimental data, equipped laboratories, support of sponsors, translations and publications, cultivation of a teaching succession, etc.) formed a scientific picture of the world which was different from the scholastic one, which predetermined the impressive success of Eastern medieval science. Moreover, Eastern science immediately began with a reflection and reassessment of the most important assumptions in the form of Aristotelian philosophy as the unshakable authority of that time, as well as with distinctions between subjects of theology and science. That was another factor of the Eastern science success. Abū Reyhan Muḥammad ibn Ahmed al-Berūnī was one of the originators and intellectual heroes of this scientific revolution. "Before Khorezm was finally conquered by Mahmud Ghaznavi, all sciences were developing rapidly in Gurganj, and the main figures of scientific life in Khorezm were Ibn Sina and Beruni" [7].

Critical attitude to pagan authorities was a distinctive feature of al-Beruni's curious and independent mind. He was familiar with the works of great representatives of Greek philosophy and science: pre-Socratic natural philosophers, Plato, Aristotle, Ptolemy, Euclid, Neoplatonists and Neopythagoreans, with the works of Indian, Byzantine and Muslim scientists, as evidenced by comments, explanations, judgements and polemics with fellow scientists in his works. The philosophical form of al-Beruni's work, just as Plato's work, for example, can be characterized as syncretism — the combination of heterogeneous philosophical principles within one system. His philosophical views are scattered throughout his scientific works, from which they can be partly reconstructed. Unfortunately,

several special philosophical treatises by al-Beruni, mentioned by researchers of his work, have been lost. The thinker was characterized by close interrelation between concrete scientific knowledge in the field of mathematics, physics, astronomy and philosophy. Beruni linked the clarification of ontological questions of space and time, motion and prime mover, essence and existence with the understanding of the structure of the universe being, while his ethnographic research was intertwined with comprehension of social and cultural concepts as well as anthropological and ethical problems. The popularity of Peripatetic philosophy did not prevent him from criticizing Aristotle's views, for which Ibn Sina criticized al-Beruni himself: "Your manner of presenting Aristotle's words as unreasonable is vicious and unworthy" [3]. Ibn Sina, answering al-Beruni's questions about Aristotle's book "On the Sky" in a famous correspondence, reports on his (al-Beruni's) natural philosophical views: "...Anaximander asserts the same thing as you, namely, that the original element is air. When the quality of coldness acts upon it, it is (according to him) converted into water; but if it is heated by the motion of the celestial sphere, it becomes fire or ether" [3]. The natural philosopher al-Beruni inclined to a deistic view of the universe. Without questioning the Creationist idea of God's creation of the world, he allowed the further development of nature according to his own laws. Al-Beruni, for example, agrees with the Indian opinion stated in the "Vishnupurana", which says: "Matter is the primary basis of the world. Its action arises from natural impulse... by free choice..." [2]. On his own behalf, al-Beruni adds that God is exalted above matter, and also, "Through God, matter becomes an acting force that labors for him as a friend who unselfishly labors for his friend" [2]. In general, al-Beruni's ontological views can be characterized as hyleomorphic universalism, as he agrees with the view that all substances, with the exception of God, are formed from matter and form. The greatest contribution to philosophy, in our opinion, was al-Beruni's advanced methodology of scientific cognition and his development of the empirical inductive method of cognition, but this is a vast topic requiring a separate study. He developed an essentially modern methodology of scientific cognition based on observation and experiment. Al-Beruni is one of the earliest, if not the earliest representative of experimental and pragmatic science, the aim of which is to apply the results of research in a practical way, in full accordance with the motto of the Mamun Academy — "Science for the benefit of people". Abu Rayhan Beruni headed this illustrious scientific school in Gurgenj, the capital of Khorezm, at the beginning of the XI century.

The name of the scientist is widely known, first of all, for his contribution to natural sciences. The intellectual world is less familiar with the fact that al-Beruni was one of the thinkers who pioneered comparative religion. His works "Monuments of Past Generations", "India" and "Geodesy" contained extensive information about religious views, holidays and rituals of various peoples — ancient Egyptians, Greeks, Romans, Jews, Christians, Zoroastrians, Indians and others. Describing religions, he undoubtedly favored Islam and noted its superiority: "We have described these things for the reader to be able to compare how much higher are the institutions of Islam and how clearly this contrast reveals all the customs that differ from those of Islam in their impurity" [13]. Nevertheless, in reaching his conclusions, he directly quoted the sacred texts of other religions, tried to understand them rather than prove them wrong and, at times, enjoyed expressing admiration for other cultures. The above-mentioned works demonstrated a generally uncharacteristic example of scientific objectivity, keen observation and critical approach to the sources used. In introductions to his works, the author clearly formulated the principle that still underlies religious studies: to accurately reproduce the views of adherents of various doctrines, for which "it is necessary to purify one's soul from the [bad] qualities that spoil most people and from the reasons that make a person blind to the truth" [1]. When reconstructing the worldview of a representative of another religion, one should cite his own words, "since this is his faith" and "it is better seen and understood by him" [2]. The famous Russian orientalist V.R. Rosen, characterizing the work of al-Beruni as a master of religious studies, wrote that he "breathes the spirit of impartial criticism, quite free from religious, racial, national or caste prejudices and preconceptions, criticism cautious and prudent. He brilliantly mastered the most powerful tool of the new science, i.e. the comparative method. He reflects critics which clearly understands the limits of knowledge and prefers silence to conclusions based on insuffi-

ciently numerous or insufficiently verified facts, as well as a width of views which are truly remarkable — in a word, he reflects the spirit of real science in the modern sense of the word" [10]. Al-Beruni's works which were related to various cultural and religious traditions, contained an intension of respectful, open-minded and tolerant attitude towards alien beliefs, customs and convictions. The thinker pointed out that every culture had a universal element that made all cultures distant relatives, no matter how alien they seemed to each other, and therefore the different and unfamiliar required further studying and understanding, not blind denial or violent eradication [12]. This approach, which was unique at the time, has become prevalent today. An important task that modern researchers of cultural phenomena set for themselves is to show the unity in diversity; the commonality of ethical principles and humanistic attitudes characteristic of different religions; the need for attentive and respectful attitude towards representatives of other faiths.

The unique heritage of the outstanding thinker Abu Rayhan Beruni presents not only valuable ideas about science, philosophy, religion, medicine, but also wise thoughts about spiritual and moral upbringing and education of the younger generation. Al-Beruni saw the cause of ignorance and injustice of the social system in human vices, which must be eliminated, because they spoil society and cause a threat. Believing that "violence, perjury, breach of fidelity, seizure of other people's property by deceit, stealing" negatively affects the upbringing of the younger generation, he urged people in his numerous works to be kind, sensitive, attentive, show sympathy and help each other [2]. At the same time, al-Beruni recognized that man's acquisition of negative moral qualities is influenced by external circumstances, because his nature is constantly striving "to win as much praise and approval as possible, for hearts are made to love this and the opposite" [2]. Al-Beruni was sincerely convinced that spiritual and moral perfection of a person consists, first of all, of acquiring such virtues as wisdom, activity, gratitude, patience. Achievement of perfection, as Abu Rayhan Beruni noted, can be attained in the process of widespread introduction of intellectual and moral norms in the process of upbringing and education. The great thinker, pointing to a number of positive human qualities, singled out the most important of them — the desire for justice and truth. Al-Beruni wrote that without it, it is impossible to bring up high moral traits — to be fair, sociable, demanding, persistent and frank. He assumed that the virtues recognized in society, as well as knowledge, can liberate people from ignorance [11]. Among the highest spiritual virtues of a human being, al-Beruni included the pursuit of knowledge, which is the essence of man, the basis and peak of his spiritual and moral perfection. In al-Beruni's opinion, knowledge gained as a result of diligence, great patience and hard work ennobles a person, makes him kind, generous and reasonable, directs him to the right path. To achieve the greatest success in education, al-Beruni recommends methods of both encouragement and punishment, and he attached great importance to persuasion and various conversations on a variety of topics. According to al-Beruni, spiritual and moral education should be based on the following elements of educator's activity: great interest and love for pupils, enthusiasm for teaching profession, observation, sociability, fairness, organizational skills, exactingness, persistence, frankness, striving for realization of spiritual and cognitive needs and interests, intellectual activity. Abu Rayhan Beruni also described an aim of pedagogical proficiency: "The aim is not to prolong time, but to prevent monotony, because looking at the same things for a long time, will lead to fatigue and kill patience" [6].

The analysis of spiritual and moral views of al-Beruni allows us to state that his spiritual heritage has not only not lost its significance at present, but also acquired a special sound. His idea that it is not enough to be just a highly educated person and know the rules of decent moral behaviour, it is necessary to be able to use this knowledge in practice is interesting and extremely important from the modern point of view. Al-Beruni attached primary importance to such concepts as honour and dignity, friendship and companionship, goodness, justice and conscience. It should be noted that even today these concepts have not lost their significance in the modern social reality and are used with great success in the process of upbringing and educational activities of the younger generation.

The ideas of the great scientist are still relevant not only in the field of natural sciences, but also in the field of humanitarian research and humanitarian education. They are in harmony with modern ideas and correspond to the current scientific approach, which requires accuracy and objectivity.

The name of Abu Rayhan al-Beruni is not forgotten and is heard, among other things, within the walls of SPbSMPU in the context of the conversation about Muslim philosophy and medicine of the Medieval East.

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ARCHITECTURE OF SAINT PETERSBURG HOSPITALS: FROM PETROVSKY BAROQUE TO HI-TECH. PART II. CLASSICISM

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ABSTRACT. This article continues a research project dedicated to the hospital architecture of St. Petersburg from a historical perspective: from Peter the Great's baroque to high-tech. The second article in the series views the classicism style, which established itself in the city's architecture in the 60–70s of XVIII century. The central place in this article is given to the history of construction and the architectural and urban appearance of the Mariinsky Hospital — one of the best examples of St. Petersburg classicism. The history of creation, artistic and architectural compositional features of the Kalinkinskaya and Obukhovskaya hospitals, the main building of the Military Medical Academy, etc. are also viewed. Attention is paid to architectural and artistic design and reconstruction of buildings that were not originally intended for hospital needs: such as hospital for the mentally ill of St. Nicholas the Wonderworker in the Strait and Workhouse, Marine Hospital in the house of Princess Shakhovskaya near the Kalinkin Bridge on the Fontanka river, Midwifery Institute building in the mansion of Prince Dolgorukov, Elizabethan commune of sisters of mercy in the Kushelev-Bezborodko estate, hospital of St. Mary Magdalene in the house of the merchant I.V. Kusova. Also, an evolution of hospital construction during the period under review is noted: when the central corridor system, which had become a traditional method of constructing barracks-type hospitals was abandoned, and the layout of hospital buildings with a side corridor appeared, which has enormous hygienic advantages. Most of the classical-style hospitals built in the second half of the 18th — first third of the 19th centuries not only continue to provide medical care to St. Petersburg residents, but are also still an adornment of the northern capital, giving its noble restraint and refined elegance.

KEY WORDS: Saint Petersburg; hospital architecture; classicism; Mariinsky Hospital; Kalinka Hospital; Obukhov Hospital; Empress Maria Feodorovna; Prince P.G. Oldenburgsky.

АРХИТЕКТУРА БОЛЬНИЦ САНКТ-ПЕТЕРБУРГА: ОТ ПЕТРОВСКОГО БАРОККО К ХАЙ-ТЕКУ. ЧАСТЬ II. КЛАССИЦИЗМ

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РЕЗЮМЕ. Настоящая статья продолжает исследовательский проект, посвященный больничной архитектуре Санкт-Петербурга в историческом ракурсе: от петровского барокко до хай-тека. Вторая статья цикла рассматривает классицизм — стиль, утвердившийся в архитектуре города в 60–70-е годы XVIII века. Центральное место в работе отведено истории возведения и архитектурно-градостроительному облику Мариинской больницы — одному из лучших примеров петербургского классицизма. Показана также история создания, художественные и архитектурно-композиционные особенности Калинкинской и Обуховской больниц, главного корпуса Военно-медицинской академии и др. Уделено внимание архитектурно-художественному решению и перестройке зданий, изначально не предназначавшихся для больничных нужд: больницы для душевнобольных св. Николая Чудотворца в Смирительном и работном доме, Морского госпиталя в доме княгини Е.Е. Шаховской у Калинкина моста на Фонтанке, зданию Повивального института в особняке князя Я.П. Долгорукова, Елизаветинской общине сестер милосердия в усадьбе Кушелева-Безбородко, больнице Святой Марии Магдалины в доме купца И.В. Кусова. Отмечена эволюция больничного строительства в рассматриваемый период: когда происходит отказ от центрально-коридорной системы, ставшей традиционным приемом строительства больниц казарменного типа, и вводится планировка больничных зданий с боковым коридором, представляющая огромные преимущества в гигиеническом отношении. Большинство построенных еще во второй половине XVIII — первой трети XIX века больниц в классическом стиле не только продолжают оказывать медицинскую помощь петербуржцам, но и по-прежнему являются украшением северной столицы, придавая ей благородную сдержанность и изысканную элегантность.

КЛЮЧЕВЫЕ СЛОВА: Санкт-Петербург; больничная архитектура; классицизм; Мариинская больница; Калинкинская больница; Обуховская больница; императрица Мария Федоровна; принц П.Г. Ольденбургский.

In the 60s–70s of the XVIII century, a new style — classicism — was established in the architecture of St. Petersburg, which was characterized by an appeal to ancient examples as a standard of harmony, beauty and perfection[1]. Solemnity and monumentality, strict logical sequence of architectural orders, symmetrical composition and a minimum amount of decoration is peculiar to this artistic direction features.

The Mariinsky Hospital is rightly considered a masterpiece of architecture of the Classicism era. At the very beginning of the XIX century, owing to the approaching centenary of St. Petersburg, the Dowager Empress Maria Feodorovna addressed her son — the Emperor Alexander I with a proposal to establish a hospital, where it was possible to "provide gratuitous medical assistance ... to poor and indigent patients" (Fig. 1) [28]. Alexander I was sympathetic to the request of the august mother. On 4 June 1803 an outpatient infirmary was opened in the Education House on the Fontanka River, not far from the Kalinkin Bridge, where patients were admitted without distinction of sex and religion, and in addition to medical examination received free medicines.

Simultaneously, construction of a special hospital building on the territory of the Italian Garden began under the project and under the guidance of the talented architect Giacomo Quarenghi (1744–1817) (Fig. 2, 3)[2]. On 28 May 1803 a stone with an inscription was laid: "This stone is laid for the foundation of the Holy Church of the First-Deceased Apostle Paul in the hospital

[1] The first article of the series "Hospital Architecture of St. Petersburg", dedicated to the Peter the Great Baroque, was published in the journal "Medicine and Health Care Organization". 2023; 3: 89–101 [21].

[2] The Italian Garden is one of the first gardens of St. Petersburg, established in the first quarter of the XVIII century on the bank of the Fontanka River and extending to Znamenskaya Street. [17].

Fig. 1. Empress Maria Feodorovna (1759–1828). The portrait was bequeathed to the hospital by the Empress [12]

Рис. 1. Императрица Мария Федоровна (1759–1828). Портрет завещан больнице императрицей [12]

Fig. 2. Giacomo Quarenghi (1744–1817) [10]

Рис. 2. Джакомо Кваренги (1744–1817) [10]

for the poor 200 people who were maintained and treated without money, as well as for an undetermined number of people coming" [28]. In Spring 1805 the construction of the buildings of the new hospital was completed. On 2 July 1805 the church was consecrated in the name of the Holy Apostle Paul, the heavenly patron saint of Emperor Paul I, the beloved husband of Maria Feodorovna, who was murdered in 1801 (Fig. 4). It was the first hospital church in St. Petersburg. According to the founder's idea, it was the church was to become the "heart" of the hospital, because "merciful service to the sick should have a genuine spiritual basis" [12]. This idea of the Dowager Duchess was brilliantly embodied by Giacomo Quarenghi. The temple was placed on two floors. It was marked by a majestic portico on the side of the apse[1], by a semicircular apse on the opposite side, and in the upper part — by a half-dome and a gilded cross. The two-light church hall, which accommodated more than two hundred people, was bright and festive thanks to the rows of large windows under the ceiling and a huge ivory chandelier with gilding. The temple had excellent acoustics, which allowed to listen to the church service both to parishioners and to patients in the wards. The iconostasis with pilasters and pediment above the royal gates made of artificial marble looked marvelous. The temple was constantly "beautified by the diligence of the hospital's founder and members of the imperial house, as well as representatives of various classes" [12].

On 30 August 1805, the grand opening of the "Hospital for the Poor" (as it was called by the citizens) took place on the name day of Emperor Alexander I. It was a great event in the life of St. Petersburg [4, 12, 28]. The police all over the city was notified that "...every day poor patients could appear and be brought … for admission to the wards" [12]. The same notification was also made in some foreign cities.

The central building of the hospital and its side wings faced Liteiny Prospekt with their main facades (Fig. 5). According to the rules of previous hospital buildings, they were erected just outside the city limits, away from the noise and bustle — "in a decent place for sick people" [12]. At that time Liteiny was still on the outskirts of the city. G. Quarenghi applied a mansion scheme of the hospital layout, moving a two-story central building far away from the red line of the avenue (Fig. 6) [26]. The front yard is separated from the street by a monumental cast-iron fence with two

[1] Apse — a lowered projection of a building attached to the main volume, semicircular, rectangular or faceted, covered with a half-dome or a closed half-vault. As a rule, this term denotes altar volumes in church architecture.

Fig. 3. Hospital for the poors. 1821–1822. Lithography [23]

Рис. 3. Больница для бедных. 1821–1822. Литография [23]

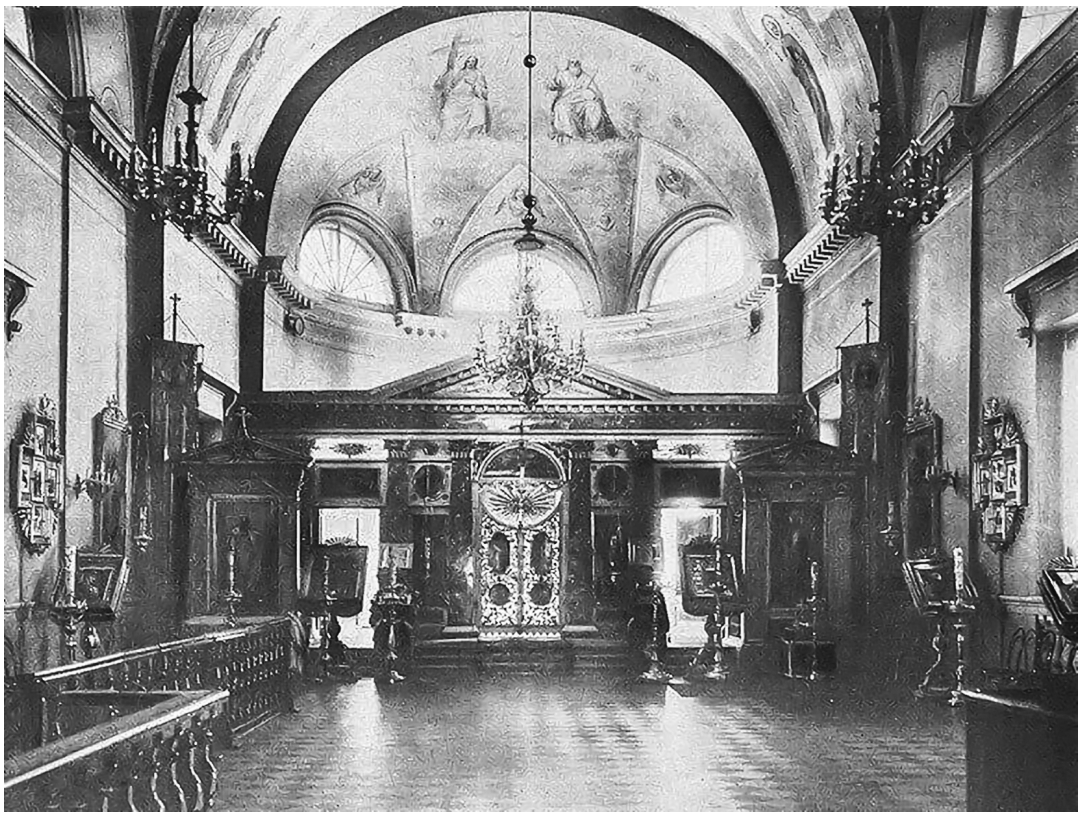

Fig. 4. The Church of St. Paul the Apostle at the Mariinsky Hospital [12]

Рис. 4. Храм Святого Апостола Павла при Мариинской больнице [12]

Fig. 5. The facade of the Hospital for the poors. Drawing [35]

Рис. 5. Фасад Больницы для бедных. Рисунок [35]

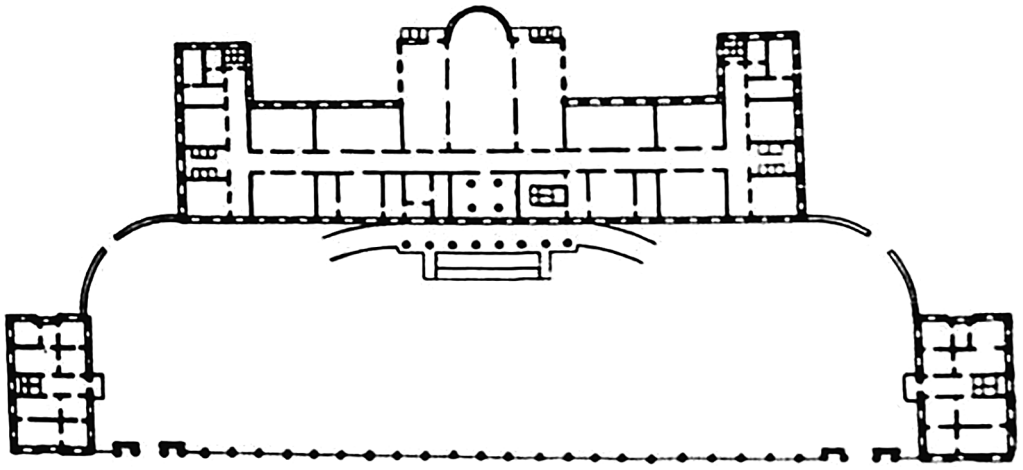

Fig. 6. Plan of the Hospital for the poors [35]

Рис. 6. План Больницы для бедных [35]

gates on each side. The two-story side wings, intended for employees' housing, were connected with the central building by stone arc-shaped fences, closing the front yard. The building of the hospital is kept in strict, laconic and monumental forms which are characteristic for classicism. The horizontally stretched central building is decorated with a magnificent eight-column Ionic portico on a low plinth; two gentle ramps lead to the entrance, which was convenient both for patients and for their transportation (Fig. 7). The facade is completed by a triangular pediment decorated with a bas-relief composition: a laurel wreath with an imperial crown and ribbons on the sides, inside it — a double-headed eagle with crowns, on its chest — a pelican feeding three chicks with its blood (Fig. 8)[1].

G. Quarenghi carefully thought out an internal layout of the hospital. The principle of corridors penetrating the whole building with wards placed on the sides is still used today (Fig. 9). The wards were separated from each other by thick walls so that "the moans of the hopelessly ill did not disturb the peace of the convalescents, and ... sticky diseases could not spread" [12, 14]. The wards had up to 15 beds. The hospital was designed for 200 patients of both sexes. The right side of the building was for men and the left side — for women. 20–30 beds were always in reserve in case of urgent isolation of patients.

Great attention was paid to the lighting of corridors and staircases, special attention was paid to air exchange in the wards. Channels were made in inner walls and led out under the roof to open air; they were connected to the wards through vents equipped with iron shutters. There were also fans and small windows in the corridor, which facilitated air exchange between the wards and the corridor [12].

The lower semi-basement was used for kitchens, storerooms for medicines and storage of patients' clothes, banyas and baths. The mezzanine floor contained a pharmacy, rooms for examination of patients and surgical department, an operating theatre, rooms for convalescents

[1] Emblem of the Empress Maria Fyodorovna's Department.

Fig. 7. Facade of the central building of the Mariinsky Hospital

Рис. 7. Фасад центрального корпуса Мариинской больницы

Fig. 8. Bas-relief of the pediment of the central building of the Mariinsky Hospital

Рис. 8. Барельеф фронтона центрального корпуса Мариинской больницы

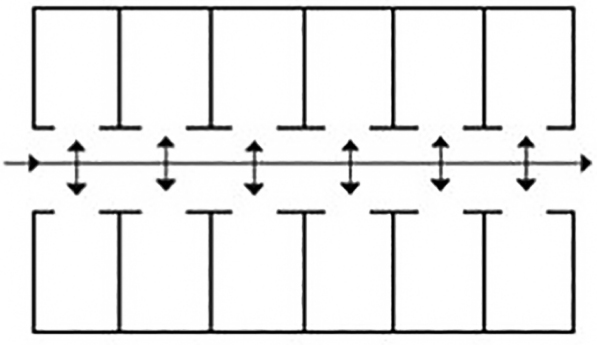

Fig. 9. Corridor layout [25]

Рис. 9. Коридорная планировка [25]

and patients coming for medicines[1]. The upper floor housed patients suffering from internal diseases.

Quarenghi designed a regular garden with many flower beds and a pond around the hospital, which was used for water intake before the construction of a water supply system[2]. By the end of the 1820s

[1] The outpatient department and support staff were moved from the hospital at Kalinkin Bridge to the new building.

[2] The Mariinsky Hospital was the first hospital in St. Petersburg to acquire a water supply system (1830s), carrying water from the Fontanka River, which was still relatively clean at that time. In the 1840s, when water from the Fontanka became unsuitable for the needs of the hospital, it was taken from the Neva River.

the hospital garden was already an example of a landscape park. The rest of the hospital territory was allocated for greenhouses and vegetable gardens, which brought a considerable income.

In June 1805, the rules of the hospital were approved — "Brief outline of rules for running the Hospital for the Poor". The word "brief" in the title does not quite correspond to the content. The rules set out in detail who could be admitted to the hospital, strictly regulated the duties of all employees, the daily routine in the hospital, etc. Clause 9 determined: "Since this hospital should be in favor of the poor and indigent without any payment for their treatment and maintenance during their illness, the livery attendants and other people with payment will not be accepted, because they have other hospitals, where they are accepted for a known fee" [12, 14, 28]. Military men, pregnant women, serfs, those infected with venereal diseases, and the incurably crippled were not admitted to the hospital. They had to apply to appropriate medical institutions.

Later Empress Maria Feodorovna issued an order not to admit to the hospital those suffering from tuberculosis "if there is no hope for their cure", explaining it by the harmful effect of the hospital air on them. In 1827, she approved 50 beds for chronic patients and explained that she meant such patients "whose treatment is expected to be long-term, but who, however, are not considered incurable and this distinction must be observed with precision, since the hospital should not be converted to an almshouse for the incurable" [12, 14, 28].

Maria Feodorovna was directly involved in the first 25 years of the hospital's activity. Responsibility, diligence, discipline, the ability to get into the essence of any case, faith in her mission, organizational skills inherent to her were manifested in the hospital. Rapid fulfilment of the project, elaboration of all aspects of its activities, drawing up detailed instructions for the staff, etc., testified to this fact. The Empress Dowager personally determined and approved all the staff, took an interest in all the affairs of the hospital, entered into every detail, examined and solved absolutely private and special questions. The chief doctor, through the Honorable Guardian, submitted a daily report to the Empress on the number of patients and a monthly monetary report. Maria Feodorovna's care for the sick was not limited to reviewing reports, checking papers, accounts, and making decisions; she often came, sometimes unexpectedly, to the hospital and examined it herself, visited and comforted the sick. Even three days before her death, being already seriously ill, she was still receiving reports and making orders for the hospital.

On 24 October 1828, Empress Dowager Maria Feodorovna died. Many famous people highly appreciated her deeds, Pushkin was among these people. He wrote in the magazine "Contemporary": "There is no person in history, which could be compared with the

Fig. 10. The pediment of the central building of the Mariinsky Hospital

Рис. 10. Фронтон центрального корпуса Мариинской больницы

Fig. 11. Angel statue on the pediment of the central building of the Mariinsky Hospital

Рис. 11. Статуя ангела на фронтоне центрального корпуса Мариинской больницы

Fig. 12. Prince Peter Georgievich of Oldenburg (1812–1881) [12]

Рис. 12. Принц Петр Георгиевич Ольденбургский (1812–1881) [12]

deceased Empress in all respects... She showed the world a marvelous example of modesty. She took into her direct charge only one part of administration, which required heartfelt participation, tender care, where everything depended on angelic patience; and she was only the Minister of Charity for three reigns" [20].

The St. Petersburg Hospital for the Poor became known as the Mariinsky Hospital in memory of the Empress and her "maternal care for the suffering". The smooth frieze of the central building of the hospital was decorated with the inscription: "Mariinsky Hospital, established for the poor in 1803" (Fig. 10). In 1868 a statue of an angel with crossed arms, donated by the antique lover and patron of the arts Count V.P. Orlov-Davydov (Fig. 11) was installed on the pediment [32].

Activities of the hospital were under a tireless control of the imperial family, and the Board of Trustees, in addition to representatives of the reigning dynasty, included wealthy merchants and public figures. The Council financed the repair and reconstruction of the hospital premises, the construction of new buildings, the purchase of new medical equipment, the feeding of patients and the purchase of medicines.

For more than 40 years — from 1839 to 1881 — the hospital was managed by Prince Peter Georgievich Oldenburgsky (1812–1881), the grandson of Emperor Paul I and Maria Feodorovna (Fig. 12). He invested a lot of effort, energy and personal funds into the proper operation and development of the clinic, its improvement and better equipment.

In 1848 the construction of the Alexandrinsky Women's Hospital, established by Emperor Nicholas I in memory of his youngest daughter, Grand Duchess Alexandra Nikolaevna, who died in childbirth, was completed on the territory of the Mariinsky Hospital. It was supposed to accommodate "those suffering from serious chronic illnesses that had no hope of cure and could not be admitted to ordinary city hospitals" [19].

The architect A.P. Brullov (1798–1877) proposed an innovative architectural and artistic solution of a relatively small hospital designed for 50 beds (Fig. 13, 14). Great height of wards created conditions for good air exchange, the wards were located on one side of the hospital corridor and faced south-east (Fig. 15) [13]. Huge arched windows provided maximum illumination with

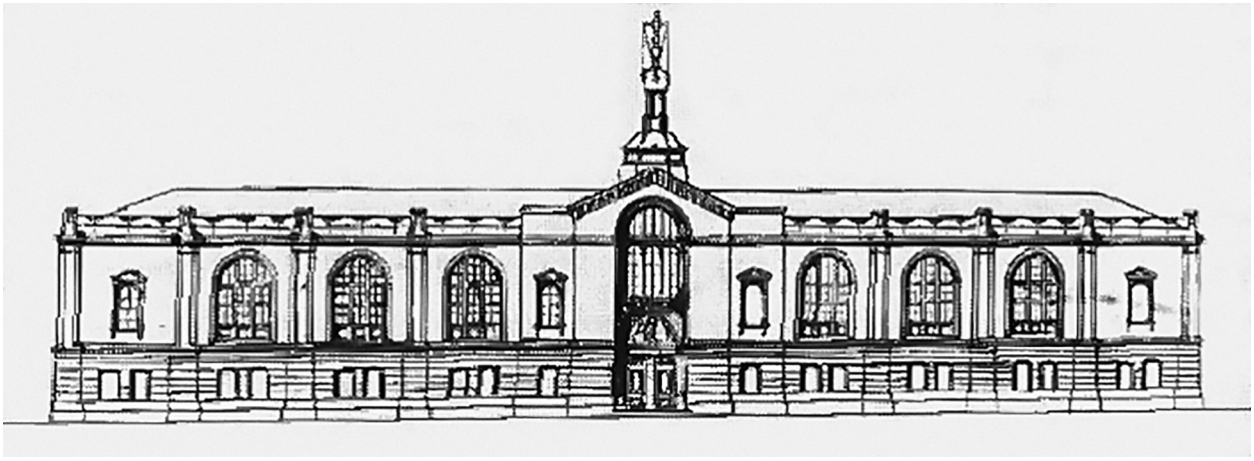

Fig. 13. Architect A.P. Bryullov. The project of the Alexandrinsky Hospital. The facade from the street side. 1844 [19]

Рис. 13. Архитектор А.П. Брюллов. Проект Александринской больницы. Фасад со стороны улицы. 1844 [19]

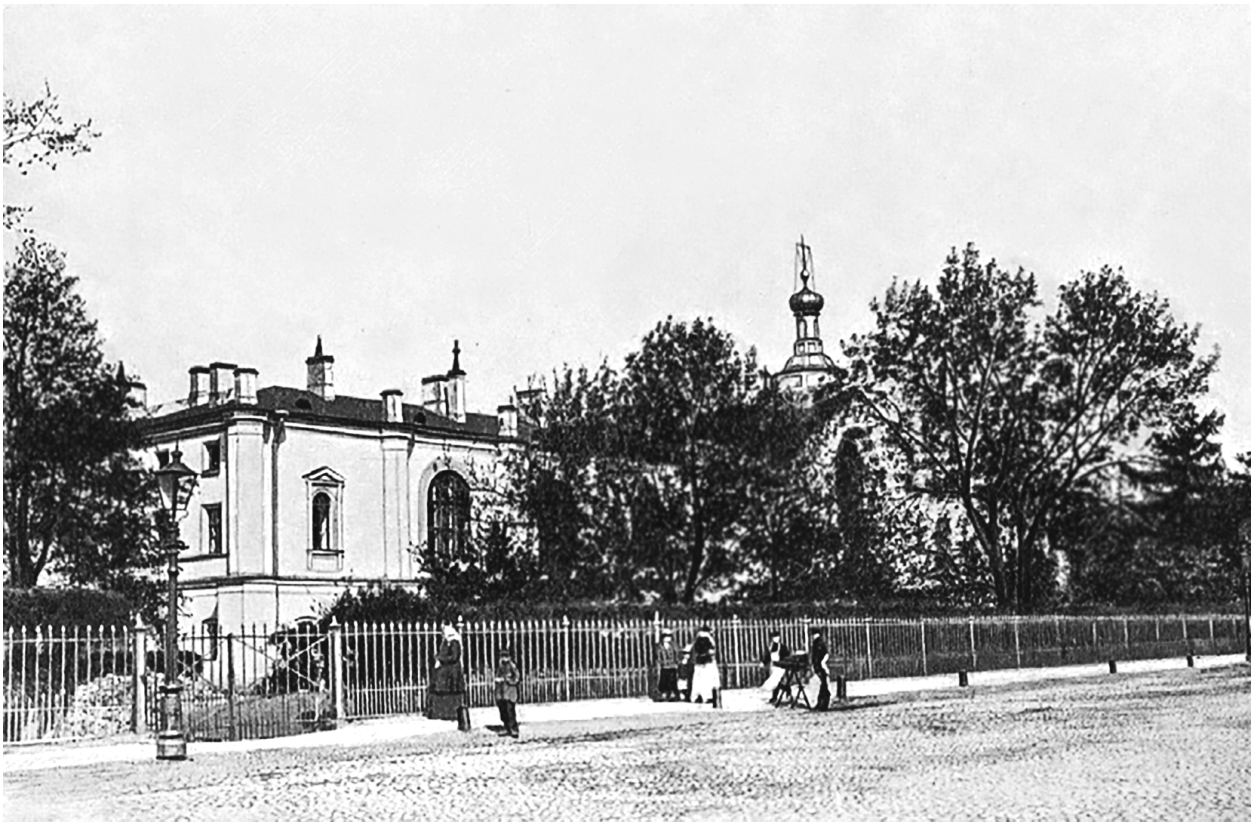

Fig. 14. Alexandrinsky Women's Hospital [19]

Рис. 14. Александринская женская больница [19]

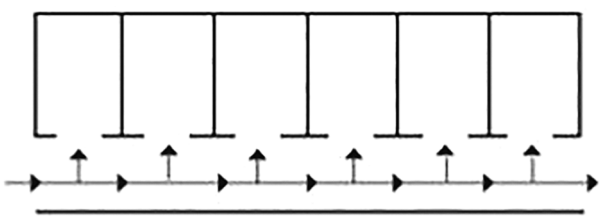

Fig. 15. Layout of a one-way corridor building [25]

Рис. 15. Планировка при односторонней застройке коридора [25]

direct sunlight and brought the classical building closer to the Gothic tradition. The architect resolutely abandoned porticoes and colonnades and placed between the windows narrow and long pilasters remotely resembling Gothic bundles of columns. Parts of the walls without large openings were treated in the tradition of Classicism — they were decorated with rustic and sandrics. The architect also placed a small dome with an onion-shaped chapter topped with a cross over the hospital church. Alexandrinsky women's hospital illustrates how the canons of classicism give way to new compositional patterns under the pressure of functional requirements [30][1].

In the late 50–60s of the XIX century the Mariinsky Hospital underwent new construction works. Alexander II approved the erection of a special building for surgical patients at the request of Prince P.G. Oldenburgsky. It was completed and blessed on 16 April 1868 and consisted of a three-story building with a wide and bright corridor on the side, with a modern ventilation system and maintenance of optimal air temperature in the wards. The surgical building was designed for 160 patients. The main building still contained the therapeutic and gangrenous wards for 340 beds and 38 additional charitable beds [12, 28].

P.G. Oldenburgsky strove to maintain the hospital at the most modern level, freely and quickly satisfying the requests of doctors to acquire new surgical instruments and medical devices that were coming into practice. In 1881 the 50th anniversary of P.G. Oldenburgsky's social activity was celebrated. He received an address from the Mariinsky and Alexandrinsky Hospitals with the following words: "For more than forty years, the Mariinsky Hospital, by the will of the late Emperor Nicholas Pavlovich, has been fortunate to be under the direct guardianship of Your Imperial Highness. The Mariinsky Hospital is proud to realize that in the midst of your many and varied activities it has constantly been the object of your special attention and paternal care. With a word of heartfelt participation you dried the tears of the suffering and grieving, your high example of selflessness inspired everyone in the performance of their duty... In the hearts of a number of generations who have benefited from and served at the Mariinsky and Alekandrinsky hospitals, the memory of your benefactions is indelibly imprinted" [37].

Soon after the festivities on 2 May 1881 P.G. Oldenburgsky died, it was decided to perpetuate his memory with the construction of a monument, "which would testify to posterity that the contemporaries of the deceased prince were able to understand and appreciate his selfless service to kindness and enlightenment" [12].

On 5 June 1889 the monument to P.G. Oldenburgsky was inaugurated on the semicircular ground in front of the main building of the hospital, it was designed by sculptor I.I. Schroeder (1835–1908) (Fig. 16). The monument was created on donations collected by subscription "at the Highest Consent" throughout the Russian Empire[2].

A new stage in the life of the Mariinsky Hospital begins after October 1917. In 1918 the hospital received a new name — "Hospital in Memory of Victims of the Revolution", in the same year the church was closed. The design of the main facade of the hospital was also changed: in the early 1930s the inscription on the frieze was removed, the sculpture of an angel crowning the central portico was removed, the double-headed eagle in the pediment was replaced by the Soviet coat of arms (sculptor I.V. Krestovsky (1893–1976)). In 1935 the clinic was named after the prominent revolutionary Bolshevik V.V. Kuibyshev. The monument to Prince P.G. Oldenburgsky was replaced by a snake-coiled bowl of Hygeia — a composition symbolising medicine. During the Soviet years, a number of new buildings of the hospital were built in the style of functionalism, but they have no architectural value.

"Everything is going back to the way it was". In 1992, the hospital was returned to its historical name "Mariinskiy". In 2000, at Christmas, divine services were resumed in the Church of

[1] The building of the Alexandrinsky Hospital was later extended and rebuilt, and now houses the Russian Neurosurgical Research Institute named after Prof. A.L. Polenov.

[2] The monument depicts the prince wearing a military uniform with epaulettes in his usual pose — as if listening to a request, he is leaning slightly with his left hand on a cabinet with books, while his right hand is placed behind the side of his coat. The front side of the granite pedestal is inscribed in gilded bronze letters: 'To the Enlightened benefactor Prince Peter Georgievich Oldenburgsky. 1812–1881'. Three other sides of the pedestal are bronze bas-reliefs: the prince is among the pupils of the School of Law, at examinations in the Catherine Institute, in the children's hospital — he looks at a sick child being lifted by two sisters of mercy (P.G. Oldenburgsky was one of the founders of the K.A. Raukhfus Children's Hospital).

Fig. 16. Opening of the monument to Prince P.G. Oldenburg. 1889 [12]

Рис. 16. Открытие памятника принцу П.Г. Ольденбургскому. 1889 г. [12]

St. Paul the Apostle[1]. The Soviet symbols on the pediment of the central building were replaced by the historical bas-relief, and the angel returned to the roof of the hospital. The frieze once again bears the words "Mariinsky Hospital, established for the poor in 1803". On the eve of the 300th anniversary of St. Petersburg the bowl with the snake was removed, and on 9 August 2023 the grand opening of the monument to Prince Peter Georgievich Oldenburgsky took place [29].

A large number of hospitals of St. Petersburg were built in the style of classicism (Table 1).

In 1762 the Secret Hospital for the treatment of "clingy" (skin and venereal) diseases was opened on the Fontanka bank near the Kalinkin Bridg. The Hospital was located on the place of a spinning house and was attached to a correctional institution (prison) for "obscene wives and maidens" (Fig. 17) [15]. In 1783, the surgeon I.Z. Kelhen (1722–1810) established the "Imperial Kalinka Medical and Surgical School" to train doctors at the hospital, which was attached to the Imperial Medical and Surgical Academy in 1802. In 1831–1833, behind the old house on the Fontanka embankment, a new three-story building of the "secret" hospital for 300 beds was built in strict classical style by architect L.I. Charlemagne (1784 (1788?)–1845) (Fig. 18)[2].

In 1779, the reception of patients began in one of the first medical institutions of the city — the "common people's" Obukhov General Hospital with a department for the mentally ill [4, 6]. The hospital was initially located in six wooden barracks on the Fontanka river embankment near Obukhov Bridge. In 1782–1784, architect L. Rusko (1762–1822) built a stone two-story hospital building for men's department according to the project of architect G. Quarenghi (Fig. 19). The main facade (facing the Fontanka River) was decorated with a triangular pediment and a

[1] Due to the restoration work in the temple, services are currently being held in the 13th building of the hospital.

[2] In Soviet times, the Research Institute of Antibiotics and Enzymes was located here. Currently, the Kalinkin business center and the school "Laboratory of Continuous Mathematical Education" are located here.

Table 1

The most famous hospitals of St. Petersburg built in the classicism style

Таблица 1

Наиболее известные больницы Санкт-Петербурга, построенные в стиле классицизм

Историческое название / Historical name	**Современное название / Modern name**	**Архитектор (-ы) / Architect(s)**	**Время строительства / Period**	**Адрес / Adress**
Елизаветинская община сестер милосердия / Elizabethan community of sisters of mercy	Реставрация / Restoration	В.И. Баженов Н.А. Львов / V.I. Bazhenov N.A. Lviv	1773–1777	Свердловская набережная, 40 / Sverdlovskaya embankment, 40
		Дж. Кваренги / G. Quarenghi	1783–1784	
Обуховская больница / Obukhovskaya hospital	Военно-медицинская академия им. С.М. Кирова / Military Medical Academy named after S.M. Kirov	Дж. Кваренги Л. Руско / G. Quarenghi L. Rusko	1782–1784	Набережная реки Фонтанки, 106 / Fontanka River embankment, 106
		П.С. Плавов / P.S. Plavov	1836–1839	Загородный проспект, 47 / Zagorodny Avenue, 47
		И.В. Штром / I.V. Strom	1864–1866	Введенский канал, 1 / Vvedensky Canal, 1
Больница Святой Марии Магдалины / Hospital of St. Mary Magdalene Children's City	Детская городская больница № 2 Святой Марии Магдалины / Children's City Hospital № 2 of St. Mary Magdalene	Л. Руска / L. Ruska	1792–1793	2-я линия Васильевского острова, 58 / 2nd line of Vasilyevsky Island, 58
		Д. Квадри / D. Quadri	1828	
Императорская Медико-Хирургическая Академия. Главный корпус / Imperial Medical-Surgical Academy. Main building	Военно-медицинская академия им. С.М. Кирова / Military Medical Academy named after S.M. Kirov	А. Порто / A. Porto	1798–1809	Академика С.В. Лебедева улица, 6 Боткинская улица, 8 / Academician S.V. Lebedev street, 6 Botkinskaya street, 8
Мариинская больница / Mariinsky Hospital	Городская Мариинская больница / City Mariinsky Hospital	Дж. Кваренги / G. Quarenghi	1803–1805	Литейный проспект, 56 / Liteiny Avenue, 56
Калинкинская городская больница / Kalinkin City Hospital	Бизнес-центр «Калинкинъ», школа «Лаборатория непрерывного математического образования» / Business Center «Kalinkin», school «Laboratory of Continuous Mathematical Education»	Л.И. Шарлемань / L.I. Charlemagne	1831–1833	Набережная реки Фонтанки, 166 / Fontanka River embankment, 166
Петропавловская больница / Peter and Paul Hospital	Первый Санкт-Петербургский государственный медицинский университет им. И.П. Павлова. Поликлиника с клинико-диагностическим центром / First St. Petersburg State Medical University named after I.P. Pavlov. Clinic with clinical diagnostic center	А.Е. Штауберт / A.E. Staubert	1832–1835	Льва Толстого улица, 6/8, к. 5 / Lev Tolstoy street, 6/8, building 5

Ending of the table 1
Окончание табл. 1

Историческое название / Historical name	Современное название / Modern name	Архитектор (-ы) / Architect(s)	Время строительства / Period	Адрес / Adress
Больница для душевнобольных Святого Николая Чудотворца / Hospital for the mentally ill patients of St. Nicholas the Wonderworker	Психиатрическая больница Святого Николая Чудотворца / Psychiatric Hospital of St. Nicholas the Wonderworker	Л.И. Шарлемань / L.I. Charlemagne А.Ф. Крассовский / A.F. Krassovsky	1832–1836 1872–1876	Набережная реки Пряжки, 1 Набережная реки Мойки, 126 / Pryazhka River Embankment, 1 Moika River Embankment, 126
Кронштадтский Морской госпиталь / Kronstadt Naval Hospital	35-й военно-морской госпиталь им. Н.А. Семашко / 35th naval hospital named after N.A. Semashko	Э.Х. Анерт / E.H. Ahnert	1833–1840	г. Кронштадт, улица Мануильского, 2 Восстания улица, 2 / Kronstadt, Manuilsky street, 2 Vosstaniya street, 2
Морской госпиталь (Калинкинский) / Marine Hospital (Kalinkinsky)	Жилой дом / City house	Л.Л. Карбоньер / L.L. Carboniere	1836–1838	Набережная реки Фонтанки, 162 / Fontanka River embankment, 162
Николаевский военно-сухопутный госпиталь / Nikolaevsky military land hospital	442-й окружной военный клинический госпиталь Министерства обороны Российской Федерации имени З.П. Соловьева / 442nd District Military Clinical Hospital of the Ministry of Defense of the Russian Federation named after Z.P. Solovyov	А.Е. Штауберт А.Н. Акутин / A.E. Staubert A.N. Akutin	1838–1840	Суворовский проспект, 63/1 / Suvorovsky Avenue, 63/1
Повивальный институт / Midwifery Institute	Городской гериатрический медико-социальный центр / City Geriatric Medical and Social Center	К.И. Реймерс В.И. Собольщиков / K.I. Reimers V.I. Sobolshchikov Р.А. Гедике / R.A. Goedicke Д.Д. Устругов / D.D. Ustrugov	1851–1853 1876–1878 1910–1913	Набережная реки Фонтанки, 148 / Fontanka River embankment, 148

solemn eight-column Ionic portico standing on a rusticated ledge of the ground floor[1].

In 1836–1839 the women's department of the Obukhov Hospital was built by architect P.S. Plavov (1794–1864). It was located at the corner of Zagorodniy Avenue and Vvedenskiy Canal and was one of the most remarkable constructions of classicism in St. Petersburg (Fig. 20). The two-story buildings were united by a corner tower which was situated on a drum with semi-circular windows. The ground floor was faced with hewn Putilov limestone. The ground floor was rusticated, separated from the upper floor by a narrow belt of meander pattern[2], three-part windows were decorated with mascarons[3] with female faces. The first floor was also decorated with three-part windows marked by Ionic pilasters, triangular sandric[4] and

[1] The building has lost its original appearance due to repeated reconstructions.

[2] Meander (name from the Meander River in Asia Minor) — an ornament of a broken line at right angles in architecture. It was widely used in ancient and classicism architecture.

[3] Mascaron — a type of sculptural decoration of a building in the form of a human or animal head in full-face.

[4] Sandric — a decorative detail in the form of a small cornice or pediment above a window or door opening. In classicist architecture, sandrics in the form of a triangular pediment or straight cornice supported by a bracket were mainly used.

Fig. 17. Spinning house. Later the building of the Kalinka (Secret) hospital [38]

Рис. 17. Прядильный дом. Затем здание Калинкинской (Секретной) больницы [38]

Fig. 18. Kalinkinskaya hospital [27]

Рис. 18. Калинкинская больница [27]

balustrade[1]. Two semicircular towers complete the buildings from the courtyard side (Fig. 21). Before the revolution, the attic of the central tower was decorated with stucco with a double-headed eagle.

The internal layout of the building was also carefully considered — the chambers were located only on one side of the wide corridor and were orientated to the south and east. The remarkable composition of the grand staircase inside the round tower (Fig. 22, 23) also deserves attention. The lower part of the staircase serves as a base for a two- tiered colonnade in the form of an open arcade. The lower tier is decorated with eight smooth Doric columns arranged in a circle. The columns of the upper tier are decorated with cannelluras[2] and have Doric capitals

[1] Balustrade — a fence consisting of a number of columns — balusters supporting a horizontal beam or railing. In Classical architecture, balustrade was widely used in the decoration of facades.

[2] Cannelures — vertical grooves on the stem of a column or pilaster.

Fig. 19. Obukhov Men's Hospital. 1870s. [27]

Рис. 19. Обуховская мужская больница. 1870-е гг. [27]

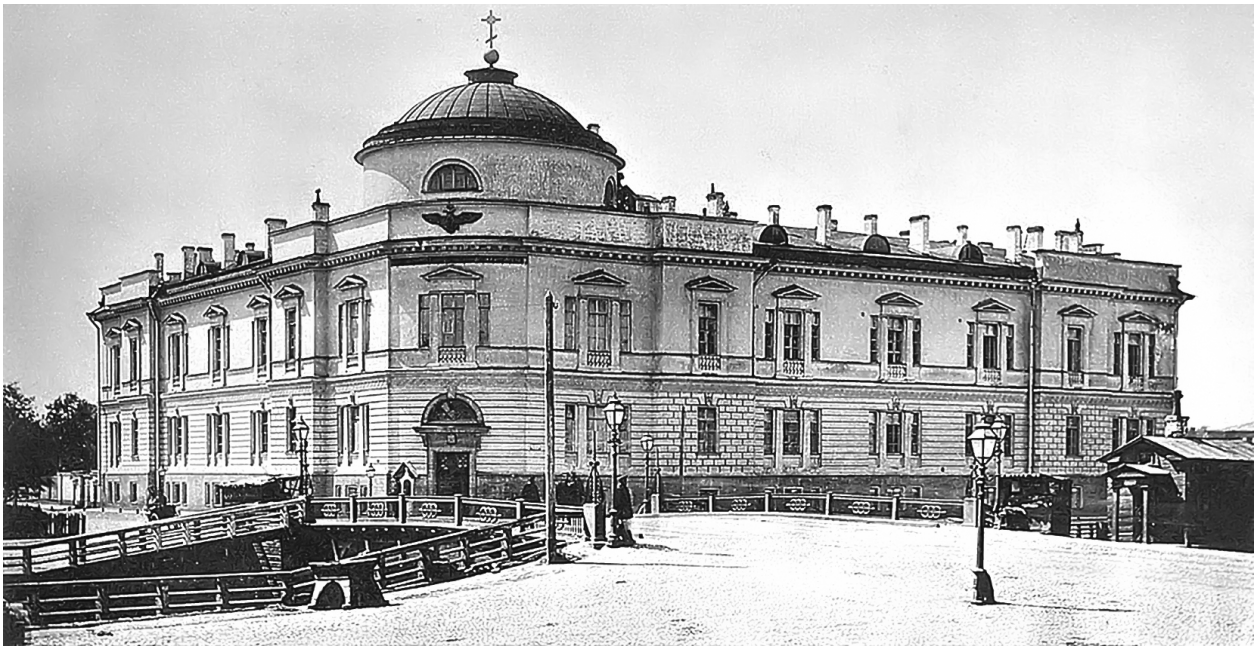

Fig. 20. The women's department of the Obukhov Hospital. 1870s. [27]

Рис. 20. Женское отделение Обуховской больницы. 1870-е годы [27]

with Ionics[1]. Wall surface of the staircase-rotunda is marked by deep semi-circular niches [26]. According to the order of Nicholas I, architect A.Ya. Andreev (1794–1878) arranged a church-rotunda under the dome, above the main staircase, which was blessed in 1840 in the name of the Holy Apostles Peter and Paul. A cross was erected in a round tower above the church[2].

In 1864–1866, architect I.V. Shtrom (1823–1888) constructed two more buildings for 300 beds along the Vvedensky Channel, one of them was named "Prince's" in honor of the "Chief Benefactor of the Empire" — Prince

[1] Ionics — elements of ornamentation which are characteristic for the Ionic style and monuments of architecture of the Ionic Order.

[2] In 1922 the Church was closed. [11]

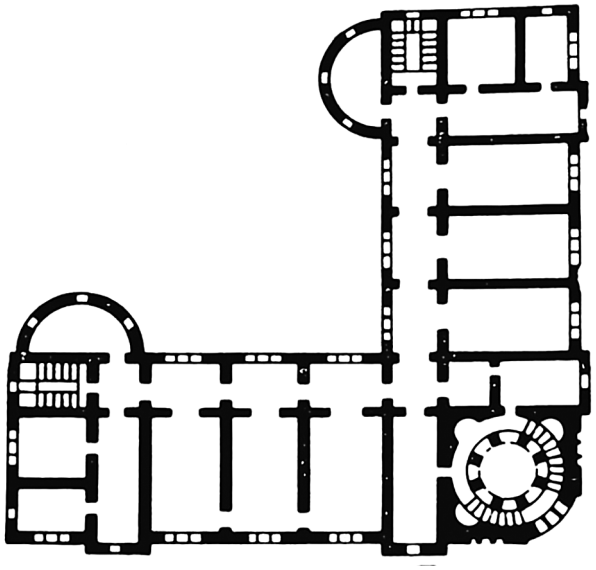

Fig. 21. The women's department of the Obukhov Hospital. Second floor plan [27]

Рис. 21. Женское отделение Обуховской больницы. План второго этажа [27]

Fig. 22. Stairs in the corner tower of the Obukhov Women's Hospital. Photo of the 70s of the XX century [26]

Рис. 22. Лестница в угловой башне женской Обуховской больницы. Фото 70-х годов XX века [26]

Fig. 23. Staircase and dome of the corner tower of the Obukhov Women's Hospital. The beginning of the XXI century [38]

Рис. 23. Лестница и купол угловой башни женской Обуховской больницы. Начало XXI века [38]

P.G. Oldenburgsky (Fig. 24). The new building adjoins the main building of the Obukhov Hospital by a small three-story stone extension. It is decorated laconically, in the style of early eclecticism with the dominance of classical decorative elements: the ground floor is separated from the upper floors by a narrow inter-story belt; the smoothness of the walls is accentuated by double arched windows of the ground floor, decorated with molded archivolts[1] and wide lesenes (pilaster strip)[2] [18]. “Prince Building” was designed with a very wide and bright side corridor, which served as a place of day stay for convalescents and a vast reservoir of clean air for the wards [3].

One of the best examples of strict St. Petersburg classicism is the main building of the S.M. Kirov Military Medical Academy (Fig. 25). On December 18, 1798 Emperor Paul I signed a decree “on ... arranging a special building for a medical school and educational theatres at the main hospitals” [4]. The construction was carried out on the Vyborg side, close to the existing Land and Sea hospitals, under the direction of architect Antonio Porto, and was completed in 1809[3]. In terms of architectural

[1] Archovolt — exterior framing of the arch opening, highlighting the arch from the plane of the wall.

[2] Lesene (architecture) — A vertical flat and narrow projection of a wall that has no base or capitals, unlike a pilaster.

[3] The opinion that A.N. Voronikhin supervised the completion of the Main Building of the Military Medical Academy is disputed by a number of researchers [38].

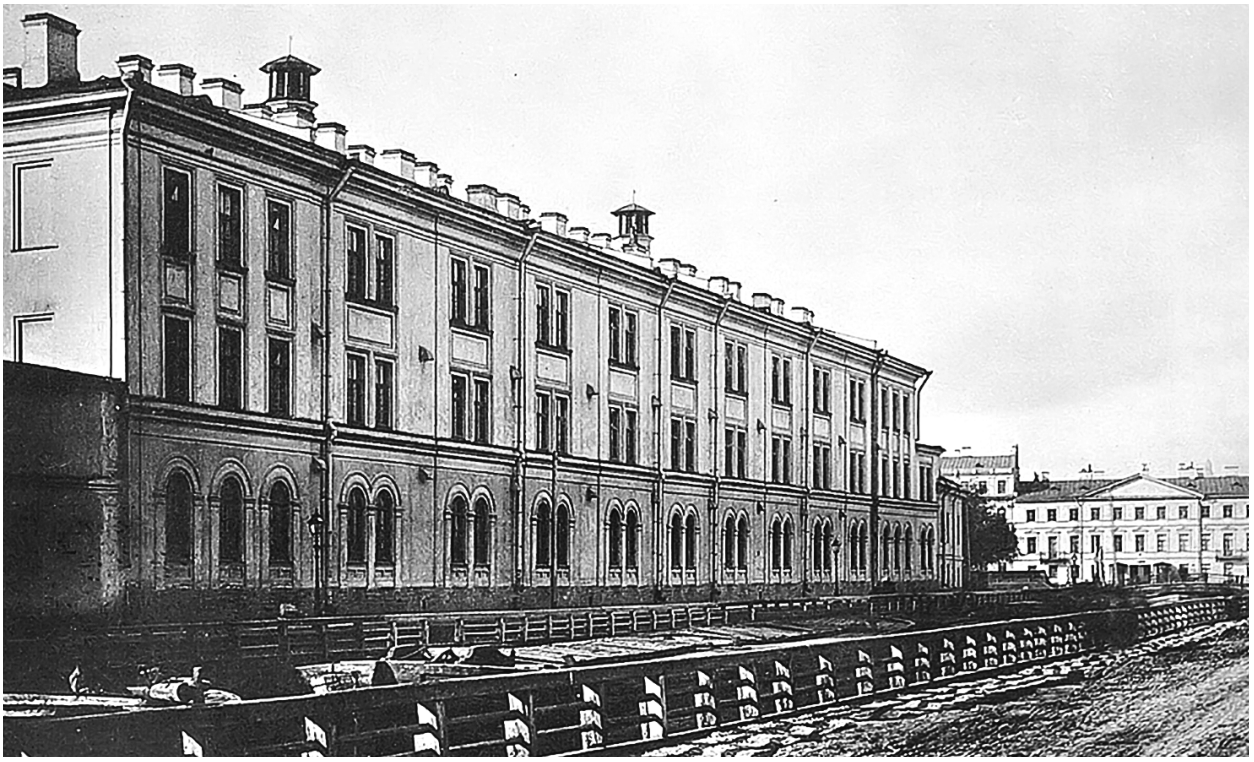

Fig. 24. “Prince's building” of Obukhov hospital. 1870s [26]

Рис. 24. «Принцевский корпус» Обуховской больницы. 1870-е годы [26]

Fig. 25. The main building of the Military Medical Academy and the monument to the life physician Ya. Willie. Photo. 1914 [38]

Рис. 25. Главное здание Военно-медицинской академии и памятник лейб-медику Я. Виллие[1]. Фото. 1914 г. [38]

[1] In 1859 a memorial was erected near the main building of the Military Medical Academy. It was dedicated to Lieutenant-Medic Y. Wylie, who headed the Academy for 30 years (sculptor D.I. Iensen). In 1949 the monument was removed, and in 1964 it was installed in the academy park. In 1996, the “Hygieia” fountain (sculptor D.I. Iensen) was moved to the place where the monument to Y. Wylie originally stood. By that time, the fountain was located at the place where the monument to military medics was erected in 1996.

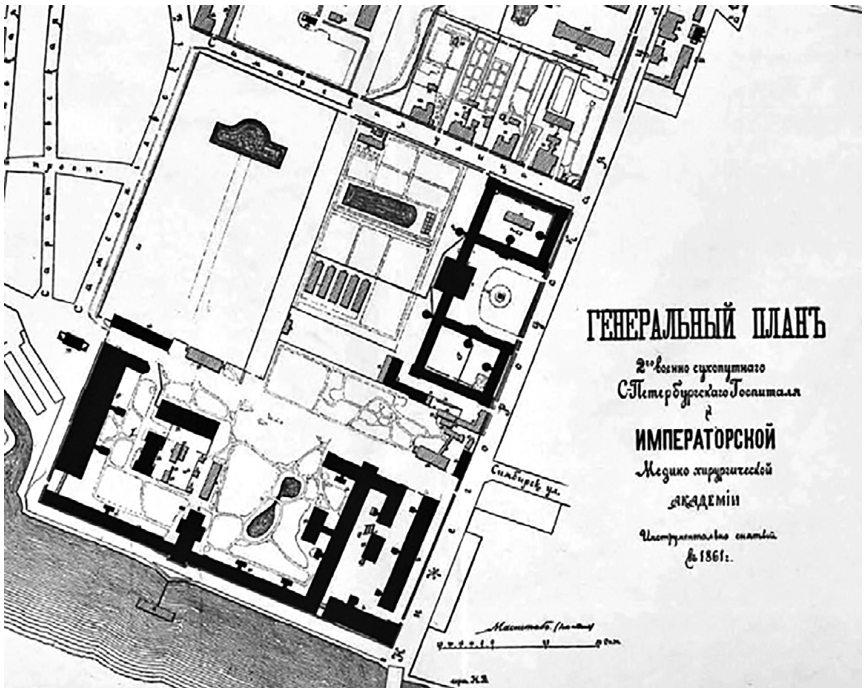

Fig. 26. The general plan of the 2nd military-land St. Petersburg Hospital and the Imperial Medical Surgical Academy. 1861 (Fragment) [5]

Рис. 26. Генеральный план 2-го военно-сухопутного Санкт-Петербургского госпиталя и Императорской Медицинской Хирургической Академии. 1861 г. (Фрагмент) [5]

and planning composition, the two-story stone ensemble is close to a Russian country estate of the second half of the XVIII — early XIX centuries (Fig. 26). The central building, located in the depth of the vast front court of honour[1], is connected with two symmetrical, rectangular side wings. Its facades face the street leading to the Neva River (now Academician S.V. Lebedev Street). The main building, marked by a portico of six Corinthian columns bearing a pediment, is crowned with a flat dome. Similar domes also crown cubic corner pavilions of side outhouses equipped with loggias. The building is characterized by strict nobility and met the highest requirements of medical science of that time.

However, a number of buildings were not originally intended for hospital needs. For instance, the hospital building of St. Nicholas the Wonderworker which served for treatment of mentally ill patients had been constructed by the architect L.I. Charleman as a house of restraint and labor (correctional institution) (Fig. 27). After the prisoners were discharged, a large-scale reconstruction began under the direction of architect A.F. Krassovsky (1848–1918). There were arranged new staircases, dark rooms were eliminated, wards were equipped with water closets, an "in-hospital telegraph" was created, heating was arranged according to the innovative system of engineer I.D. Flavitsky. Wooden barracks on the territory were thoroughly repaired and adapted for summer stay of patients [33].

In 1835 a two-story stone house of Princess E.E. Shakhovskaya was bought for the Naval Hospital. The building was located near the Kalinkin Bridge on the Fontanka River (Fig. 28). It was partially rebuilt under the supervision of the military engineer L.L. Carbonnière (1770–1836), and 330 patients could be accommodated here. The facade of the building was preserved with laconic decoration and conveys the austere beauty of late classicism (Empire style)[2].

A classic two-story mansion of Prince Y.P. Dolgorukov was built not far from the Kalinkin Bridge on the Fontanka River in 1787–1792 (Fig. 29). For several years it was owned

[1] Court of honor — a front courtyard bounded by the main building and symmetrical side wings.

[2] In 1898, an additional building was constructed over the central part of the house for the chief doctor's flat. It did not contradict the architecture of the building and fitted into its composition. The harmony was broken later, when this superstructure was extended to the entire length of the western wing, the building became asymmetrical [2, 8].

Fig. 27. St. Nicholas the Wonderworker Hospital for the Insane [27]

Рис. 27. Больница Святого Николая Чудотворца для помешанных [27]

Fig. 28. The building of the Marine (Kalinkinsky) hospital [32]

Рис. 28. Здание Морского (Калинкинского) госпиталя [32]

by Princess E.V. Zubova. In 1797 Empress Maria Fyodorovna bought the house at her own expense to accommodate "a maternity hospital for 20 beds and a Povival school for 22 girls" [31]. Later the hospital was called the Povival Institute and was placed on the first floor. Students of the midwifery school lived on the ground floor. In 1828, after the death of Empress Maria Fyodorovna, the Institute was patronized by Grand Duchess Elena Pavlovna[1] (often the Institute was called "Eleninsky").

[1] Grand Duchess Elena Pavlovna (1807–1873), born Frederica Charlotte Maria of Württemberg, wife of Grand Duke Mikhail Pavlovich. A well-known philanthropist: chief trustee of the Elisabeth Clinical Hospital for Young Children, together with N.I. Pirogov she founded the Community of the Sisters of Mercy of the Holy Cross, initiated the creation of the Clinical Institute of the Grand Duchess of Russia.

Fig. 29. The building of the Midwifery Institute. Photo by K.K. Bulla. 1890s [31]

Рис. 29. Здание Повивального института. Фото К.К. Буллы. 1890-е годы [31]

In 1845 a committee (surgeon N.I. Pirogov, writer Prince V.F. Odoevsky, architect V.I. Sobolshchikov, director of the Institute V.N. Etlinger) was established which worked out a plan of reconstruction of the Povival Institute. In 1851 architect K.I. Reimers (1815–1886) added and extended the building. In 1851–1853 V.I. Sobolshchikov (1813–1872) added a three-story courtyard wing to the main house, sewerage and water supply were installed. In 1876–1878 architect R.A. Gedike (1829–1910) erected two two-story wings on the sides of the main building and two additional wings located in the backyard. The Povivval Institute became a complex of an old house (where the midwifery school and flats of employees were located) and 5 pavilions: for women in labor, for healthy puerperae, for sick puerperae, for gynecological patients, and for outpatients. Each pavilion had its own staff and equipment, they were connected by passages that could be blocked in case of an epidemic [1, 7, 22, 24].

Despite all the expansions, the old building was still cramped and in 1904 the Povivval Institute moved to a new, specially constructed building located on Vasilievsky Island[1]. The building on Fontanka river was very soon occupied by the Community of Sisters of Mercy of the Russian Red Cross Society named after Adjutant General M.P. von Kaufmann[2]. In 1910–1913 the building was reconstructed according to the project of civil engineer D.D. Ustrugov (1875–1817): the main building — by two floors, side wings — by one floor, and the mansion of Prince Y.P. Dolgorukov finally lost its original appearance[3].

Another remarkable monument of classical architecture of the late XVIII century is the country estate of A.A. Bezborodko situated on the right bank of the Neva River (Fig. 30, 31, 32)[4]. The central three-story house with

Grand Duchess Elena Pavlovna Clinical Institute (since 1924 — State Institute for Advanced Medical Education (SIAMT), since 1993 — Medical Academy of Postgraduate Education (MAPE), since 2011 — North-West State Medical University named after I.I. Mechnikov (I.I. Mechnikov NWSMU)).

[1] Here it continues to work to our days under the name “D.O. Ott Research Institute of Obstetrics and Gynaecology”.

[2] The community was founded on 4 March 1900 by order of the patroness of the Russian Red Cross Society, Empress Maria Fyodorovna, wife of Alexander III. In 1902, not long before the death of M.P. von Kauf-Mann, who headed the Russian Red Cross for 15 years, the Community was named after him [22].

[3] In 1918 the community was liquidated, and the M.S. Uritsky Hospital continued its work here. In 1997 it was reorganized into the City Geriatric Medical and Social Center.

[4] After A.A. Bezborodko’s death, the mansion passed to his niece, Princess K. Lobanova-Rostovskaya. She brought up the son of her elder sister L.I. Kusheleva — a nephew of A.G. Kusheleva. Due to extinction of the male line of the

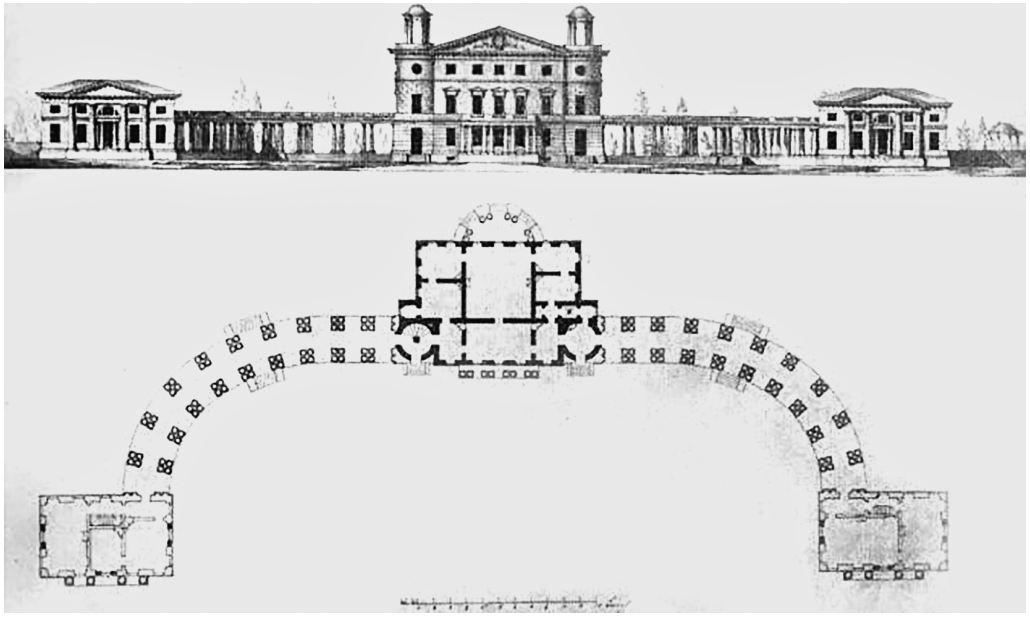

Fig. 30. Drawing and plan of the first floor of Count Kushelev–Bezborodko's dacha [38]

Рис. 30. Рисунок и план первого этажа дачи графа Кушелева–Безбородко [38]

two round towers at the corners, topped with belvedere towers, is connected by arc-shaped galleries with two symmetrical side wings. The wings are connected with each other by an original fence consisting of 29 cast-iron lions holding massive chains in their teeth. A monumental granite pier decorated with figures of four sphinxes is located in front of the building on the bank of the Neva. The central building with towers was built in 1773–1777 by V.I. Bazhenov (1797–1799). Side wings and galleries connecting them with the main building were built by D. Quarenghi in 1783–1784 [26][1]. A vast park with pavilions adjoined the manor house from the north. The park was built by G. Quarenghi. In 40–50-ies of the XIX century the Kushelev-Bezborodko mansion was famous as a therapeutic resort of Polustrovsky mineral waters.

In 1896 the building and a part of the park became the property of the Red Cross Society, and the Elizavetinskaya Community of Sisters of Mercy[2] was located here. According to the designs of architects P.Y. Suzor (1844–1919), N.V. Nabokov (1838–1907), A.V. Kashchenko (1860–1918?), standard hospital buildings were built for the Community, which became the prototype of future Soviet housing estates [9][3].

In 1828 in order to build a hospital, the treasury purchased a house on Vasilievsky Island from the heirs of the rich merchant I.V. Kusov (Fig. 33). A long facade of the two-story rectangular building faced the Makarov (former Tuchkov) Embankment. It was designed by architect L. Ruska in 1792–1793 and serves as an example of strict classicism. The central part is accentuated by avant-corps[4] with six pilasters of Corin-

Bezborodko family, Alexander I allowed A.G. Kushelev to add the Bezborodko surname to his surname. He became the owner of the estate. Over time the dacha became known as the Kushelev-Bezborodko dacha.

[1] The literature suggests that the architect N.A. Lvov was the author of the project of Bezborodko's dacha [34, 36].

[2] The Elizabethan Community of Sisters of Mercy was founded in 1896 on the initiative of Grand Duchess Elizabeth Fyodorovna. She was the head of the first St. Petersburg ladies' committee of the Russian Red Cross Society, and in late 1895 she petitioned for the establishment of the community of sisters of mercy. The community was named Elizavetinskaya in honor of the Grand Duchess.

[3] In Soviet times, the mansion served as the Karl Liebknecht Infectious Diseases Hospital, and later as a tuberculosis hospital. Currently, the company 'Monolit' is reconstructing the mansion, Count Bezborodko's dacha is planned to be turned into a cultural and business center.

[4] Avant-corps — a part of the building that protrudes beyond the main line of the facade to its full height.

Fig. 31. Kushelev-Bezborodko's cottage [38]

Рис. 31. Дача Кушелева-Безбородко [38]

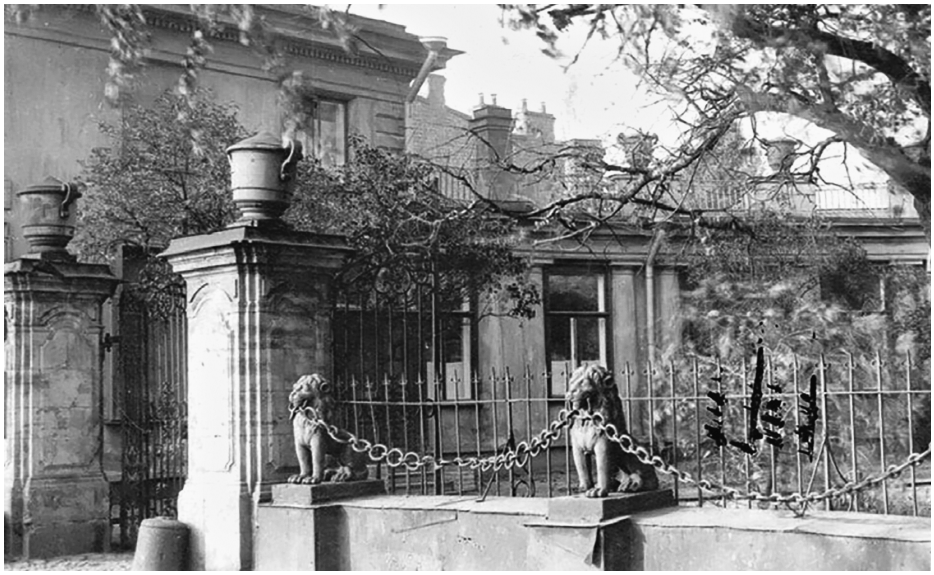

Fig. 32. The lion's fence at the Kushelev-Bezborodko cottage [38]

Рис. 32. Львиная ограда у дачи Кушелева-Безбородко [38]

thian order. A triangular pediment with denticles crowns the avant-corps. The side parts are highlighted by dentils[1]. The walls of the ground floor of the avant-corps are rusticated [16].

In 1828 Kusov's house was adapted for a hospital, which required a number of alterations made by architect D. Quadri (1773–1832). They were limited to internal rearrangements of the building and hardly touched the facades. On 24 October 1829, the first anniversary of the death of Empress Maria Fyodorovna, the hospital was inaugurated. In the name of the heavenly patroness of the Empress, the hospital was given the name of St Mary Magdalene[2].

[1] Dentil — a row of small rectangular ledges arranged in the form of an ornament on the cornice of a building, serving as decoration.

[2] In 1918, the hospital was named after revolutionary Vera Slutskaya. In 1950, the Children's Infectious Diseases Hospital was opened here, and in 1968 the hospital became a children's surgical hospital. In 1973, the Vera Slutskaya

Fig. 33. St. Mary Magdalene Hospital [27]

Рис. 33. Больница Святой Марии Магдалины [27]

In conclusion, it should be noted that the majority of hospitals built in the second half of the XVIII century — the first third of the XIX century had been designed in the classical style. They continue to provide medical care to citizens of St. Petersburg, and remain an adornment of the northern capital, contributing to its noble modesty and refined elegance.

A new stage in the development of the city's hospital architecture is associated with the Eclectic era, which will be the subject of the next article.

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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Surgical Hospital was merged with the N.K. Krupskaya Somatic Hospital. N.K. Krupskaya Somatic Hospital. The merged hospital was named after N.K. Krupskaya. In 1993, the former name was returned.

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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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ПРАВИЛА ДЛЯ АВТОРОВ

Утв. приказом и.о. ректора
ФГБОУ ВО СПбГПМУ Минздрава России от 23.06.16

НАСТОЯЩИЕ ПРАВИЛА ДЛЯ АВТОРОВ ЯВЛЯЮТСЯ ИЗДАТЕЛЬСКИМ ДОГОВОРОМ

Условия настоящего Договора (далее «Договор») являются публичной офертой в соответствии с п. 2 ст. 437 Гражданского кодекса Российской Федерации. Данный Договор определяет взаимоотношения между редакцией журнала «Medicine and health care organization / Медицина и организация здравоохранения» (далее по тексту «Журнал»), зарегистрированного Управлением Федеральной службы по надзору в сфере связи, информационных технологий и массовых коммуникаций по Северо-Западному федеральному округу 17 мая 2016 года, свидетельство ПИ № ТУ78–01872, именуемой в дальнейшем «Редакция» и являющейся структурным подразделением ФГБОУ ВО СПбГПМУ Минздрава России, и автором и/или авторским коллективом (или иным правообладателем), именуемым в дальнейшем «Автор», принявшим публичное предложение (оферту) о заключении Договора.

Автор передает Редакции для издания авторский оригинал или рукопись. Указанный авторский оригинал должен соответствовать требованиям, указанным в разделах «Представление рукописи в журнал», «Оформление рукописи». При рассмотрении полученных авторских материалов Журнал руководствуется «Едиными требованиями к рукописям, представляемым в биомедицинские журналы» (Intern. committee of medical journal editors. Uniform requirements for manuscripts submitted to biomedical journals // Ann. Intern. Med. 1997; 126: 36–47).

В Журнале печатаются ранее не опубликованные работы по профилю Журнала.

Журнал не рассматривает работы, результаты которых по большей части уже были опубликованы или описаны в статьях, представленных или принятых для публикации в другие печатные или электронные средства массовой информации. Представляя статью, автор всегда должен ставить редакцию в известность обо всех направлениях этой статьи в печать и о предыдущих публикациях, которые могут рассматриваться как множественные или дублирующие публикации той же самой или очень близкой работы. Автор должен уведомить редакцию о том, содержит ли статья уже опубликованные материалы и предоставить ссылки на предыдущую, чтобы дать редакции возможность принять решение, как поступить в данной ситуации. Не принимаются к печати статьи, представляющие собой отдельные этапы незавершенных исследований, а также статьи с нарушением «Правил и норм гуманного обращения с биообъектами исследований».

Размещение публикаций возможно только после получения положительной рецензии.

Все статьи, в том числе статьи аспирантов и докторантов, публикуются бесплатно.

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СОПРОВОДИТЕЛЬНЫЕ ДОКУМЕНТЫ

К авторскому оригиналу необходимо приложить экспертное заключение о возможно-

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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.

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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:

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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;
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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 АКЛЮЧЕНИЯ 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., Темкин Я.С., Лихачев 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.

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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).

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

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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 adap-

tation 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.

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