ISSN 2658-4212
eISSN 2658-4220

MEDICINE AND HEALTH CARE ORGANIZATION

2024, VOLUME 9, N 2

МЕДИЦИНА И ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ

2024, ТОМ 9, № 2

MEDICINE AND HEALTH CARE ORGANIZATION

2024, VOLUME 9, N 2 SCIENTIFIC AND PRACTICAL JOURNAL FOR DOCTORS

Рецензируемый научно-практический журнал
MEDICINE AND HEALTH CARE ORGANIZATION
МЕДИЦИНА И ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ
Основан в 2016 году в Санкт-Петербурге
ISSN 2658-4212 eISSN 2658-4220
Выпускается 4 раза в год
Журнал реферируется РЖ ВИНИТИ
Издатели, учредители:
Федеральное государственное бюджетное образовательное учреждение высшего образования «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России (адрес: 194100, Санкт-Петербург, Литовская ул., д. 2)
Фонд НОИ «Здоровые дети — будущее страны» (адрес: 197371, Санкт-Петербург, ул. Парашютная, д. 31, к. 2, кв. 53).
Журнал зарегистрирован Федеральной службой по надзору в сфере связи, информационных технологий и массовых коммуникаций (РОСКОМНАДЗОР)
ПИ № ФС77-74238 от 02 ноября 2018 г.

*Журнал входит в **Перечень ведущих научных журналов и изданий ВАК,** в которых должны быть опубликованы основные результаты диссертаций на соискание ученых степеней кандидата и доктора наук (Распоряжение № 427-р от 9.12.2020).*

Проект-макет: Титова Л.А.
Layout project: Titova L.A.

Электронная версия / Electronic version:
https://ojs3.gpmu.org/index.php/medorg,
http://elibrary.ru

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Формат 60 × 90/8. Усл.-печ. л. 20,5.
Тираж 100 экз. Распространяется бесплатно.
Оригинал-макет изготовлен ФГБОУ ВО СПбГПМУ Минздрава России.

Format 60 × 90/8. Cond.-printed sheets 20,5.
Circulation 100. Distributed for free. The original layout is made Saint Petersburg State Pediatric Medical University.

Отпечатано ФГБОУ ВО СПбГПМУ Минздрава России. Литовская ул., 2, Санкт-Петербург, 194100. Заказ 67.
Дата выхода 25.09.2024.

Printed by Saint Petersburg State Pediatric Medical University. 2 Lithuania, Saint Petersburg 194100, Russian Federation. Order 67.
Release date 25.09.2024.

В оформлении обложки использован фрагмент репродукции картины Л.Э. Адана «Материнство», 1898 г.

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UDC 614.2
DOI: 10.56871/MHCO.2024.55.16.001

ASSESSMENT OF SELECTED OBSTETRIC AND PERINATAL RISK FACTORS IN PATIENTS OF THE PREGNANCY PATHOLOGY DEPARTMENT WHO OVERCAME INFERTILITY USING ART

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For citation: Ivanov DO, Moiseeva KE, Kharbedia ShD, Shevtsova KG, Sergienko OI, Baksheeva LI. Assessment of selected obstetric and perinatal risk factors in patients of the Pregnancy Pathology Department who overcame infertility using ART. Medicine and Health Care Organization. 2024;9(2):6–13. DOI: https://doi.org/10.56871/MHCO.2024.55.16.001

Received: 14.05.2024 ***Revised: 17.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. In order to identify obstetric and perinatal risk factors, information was copied out from registration forms N 003/y for 820 patients in the pregnancy pathology department who had overcome infertility with the help of ART. It was found that in more than half of the cases, pregnancy occurred on the second or after several more attempts at using ART (56.1%), in most cases it was the first birth (76.8%). The proportion of patients of early reproductive age was 67.8%. The diagnosis of infertility was made before the age of 35 in 77.5% of women. In most cases, it was primary infertility (61.0%) and in 59.9% of patients, the diagnosis was established after 5 or more years of absence of pregnancy in the absence of contraception (on average, at the age of 30.04±2.72 years). On average, the period of infertility in patients was 6.18±0.19 years. 41.5% of women had a history of abortion. The proportion of abortions for medical reasons in this category of patients was 15.3 times higher than the population average, the proportion of spontaneous abortions was 1.5 times higher, and the proportion of abortions in primigravidas was 2.8 times. The most common pregnancy complications were gestational diabetes mellitus (30.49%), preeclampsia (25.12%) and complications caused by infectious diseases during pregnancy (20.73%). The most common extragenital diseases of these pregnant women were myopia (40.73%), anemia (38.78%) and thyroid diseases (35.37%). Fetal pathology was detected in 20.5% of patients. The most common reasons for hospitalization in the department were delivery by caesarean section (44.6%) and premature birth (25.9%). At the same time, natural delivery was observed only in 15.7% of patients with ART. Thus, the study made it possible to establish that patients in the Department of Pregnancy Pathology, whose pregnancies followed after the use of ART, had a significant number of obstetric and perinatal risk factors, which requires closer attention to the course of pregnancy and childbirth on the part of obstetrician-gynecologists.

KEYWORDS: pregnant women, infertility, assisted reproductive technologies, Department of Pregnancy Pathology, obstetric and perinatal risk

ОЦЕНКА ОТДЕЛЬНЫХ ФАКТОРОВ АКУШЕРСКОГО И ПЕРИНАТАЛЬНОГО РИСКА У ПАЦИЕНТОК ОТДЕЛЕНИЯ ПАТОЛОГИИ БЕРЕМЕННОСТИ, ПРЕОДОЛЕВШИХ БЕСПЛОДИЕ С ПОМОЩЬЮ ВРТ

© Дмитрий Олегович Иванов, Карина Евгеньевна Моисеева, Шалва Демнаевич Харбедия, Ксения Георгиевна Шевцова, Ольга Игоревна Сергиенко, Лидия Игоревна Бакшеева

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Для цитирования: Иванов Д.О., Моисеева К.Е., Харбедия Ш.Д., Шевцова К.Г., Сергиенко О.И., Бакшеева Л.И. Оценка отдельных факторов акушерского и перинатального риска у пациенток отделения патологии беременности, преодолевших бесплодие с помощью ВРТ // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 6–13. DOI: https://doi.org/10.56871/MHCO.2024.55.16.001

Поступила: 14.05.2024 ***Одобрена: 17.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. С целью выявления факторов акушерского и перинатального риска была проведена выкопировка сведений из учетных форм № 003/у на 820 пациенток отделения патологии беременности, преодолевших бесплодие с помощью вспомогательных репродуктивных технологий (ВРТ). Установлено, что более чем у половины пациенток беременность наступила со второй и более попытки применения ВРТ (56,1%), при этом в большинстве случаев это были первые роды (76,8%). Удельный вес пациенток раннего репродуктивного возраста составил 67,8%. Диагноз «бесплодие» был поставлен до 35 лет у 77,5% женщин. В большинстве случаев это было первичное бесплодие (61,0%), и у 59,9% пациенток диагноз был установлен через 5 лет и более отсутствия беременности в условиях отсутствия контрацепции (в среднем в возрасте 30,04±2,72 года). В среднем срок бесплодия у пациенток составлял 6,18±0,19 года. В анамнезе у 41,5% женщин были аборты. Удельный вес абортов по медицинским показаниям у данной категории пациенток был выше, чем в среднем по популяции, в 15,3 раза, удельный вес самопроизвольных абортов — в 1,5 раза, а удельный вес абортов у первобеременных — в 2,8 раза. Наиболее частыми осложнениями беременности были гестационный сахарный диабет (30,49%), преэклампсия (25,12%) и осложнения, вызванные инфекционными заболеваниями во время беременности (20,73%). Самые распространенные экстрагенитальные заболевания, которые были у этих беременных, — это миопия (40,73%), анемия (38,78%) и заболевания щитовидной железы (35,37%). У 20,5% пациенток была выявлена патология плода. Наиболее частыми причинами госпитализации в отделение стали родоразрешение с помощью кесарева сечения (44,6%) и преждевременные роды (25,9%). При этом естественное родоразрешение наблюдалось только у 15,7% пациенток с ВРТ. Таким образом, проведенное исследование позволило установить наличие значительного количества факторов акушерского и перинатального риска у пациенток отделения патологии беременности, беременность которых наступила с применением ВРТ, что требует более пристального внимания к течению беременности и родов у них со стороны врачей — акушеров-гинекологов.

КЛЮЧЕВЫЕ СЛОВА: беременные, бесплодие, вспомогательные репродуктивные технологии, отделение патологии беременности, акушерский и перинатальный риск

INTRODUCTION

According to the Federal Law “On Fundamentals of Citizens’ Health Protection in the Russian Federation” [1], the creation of optimal conditions for a woman to fulfil her most important social function — to give birth to and raise healthy children — is one of the main tasks of the system of maternal and child health care. In the context of declining birth rates, the problem of population reproduction is especially important. One of the main medical and social

problems of society is infertility. It is actual both in our country and abroad [2]. According to special studies, the number of infertile couples in Russia is about 20%. At the same time, some international experts cite figures of 24–25% [3].

According to the WHO classification, infertility can be caused by male and female factors, or their combination, as well as by undetermined etiology. In addition, infertility is divided into primary and secondary, absolute and relative [4]. An effective method of infertility treatment is assisted reproductive technologies (ART). More than ten methods of ART are used in medical practice: *in vitro* fertilization (IVF), intracytoplasmic sperm injection (ICSI), surrogacy, reproductive donation, cryopreservation and others. However, the most common method is IVF [5].

According to the clinical guidelines "Female Infertility", the indications for IVF are absolute infertility (absence of uterus, ovaries, absence or obstruction of both fallopian tubes, azoospermia, etc.), as well as a higher probability of overcoming infertility with IVF compared to other methods [6]. In addition, the use of ART is reasonable if there is no pregnancy in women under 35 years old during 12 months of infertility treatment or during 6 months in women older than 35.

In our country, the medical care for women during pregnancy, childbirth and the postpartum period is carried out in accordance with medical care procedures for the profile "Obstetrics and gynecology" [7]. It is based on the principles of continuity and stages. Prevention is a priority during a medical follow-up of pregnant women, which includes identifying women at risk for prevention and early detection of complications associated with pregnancy, childbirth and the postnatal period. If pregnant women require round-the-clock observation and treatment, they are hospitalized in the pregnancy pathology departments of obstetric hospitals. Their objectives are the detection and treatment of pregnancy pathology; prevention of complications during pregnancy; preparation for childbirth, in particular — for caesarean section, counselling and psychological support, etc.

A significant proportion of women whose pregnancies are achieved using IVF have other health problems in addition to problems in the reproductive system [8]. Accordingly, the study of their medical and social characteristics can determine the profile of the target group. In this case, it is necessary to adjust the plan of medical supervision in order to reduce complications during pregnancy and childbirth [9]. Thus, the assessment of individual obstetric and perinatal risk factors in patients of the Department of Pregnancy Pathology who have overcome infertility by means of ART is a relevant topic for research.

AIM

To determine the obstetric and perinatal risk factors in patients of the Department of Pregnancy Pathology who overcame infertility by means of ART.

MATERIALS AND METHODS

The Department of Pregnancy Pathology of the Perinatal Centre of the Federal State Budgetary Educational Institution of Higher Professional Education 'St. Petersburg State Pediatric Medical University' of the Ministry of Health of Russia, which belongs to the third-level obstetric hospitals, became the clinical base of the research. A special form was designed in order to assess the characteristics of patients who overcame infertility with the help of ART. The form "Card of medical and social examination of women suffering from infertility" includes information which was copied from 820 registration forms No. 003/u "Medical card of a patient receiving medical care in inpatient and day hospital conditions". All patients were treated at the Department of the Pregnancy Pathology, their hospitalization ended with delivery at the perinatal center of the St. Petersburg State Pediatric Medical University in 2018–2024. Women permanently residing in St. Petersburg were selected for the study.

Extensive indicators, arithmetic weighted average and its error were calculated. The obtained indicators were compared with the data of official statistics [10–14]. Perinatal risk factors in patients were assessed according to the perinatal risk scale proposed by V.E. Radzinsky [9].

The significance of the differences between the indicators was assessed using Student's t-criterion. Differences were considered significant at $p < 0.05$. Statistical processing of data was performed using MS Office 2016 and STATISTICA 10.0 (StatSoft Inc.) software packages.

RESULTS

Assessment of the age distribution of patients who overcame infertility with the help of ART showed that 65.6% of the pregnant women belonged to the age group of 35 years and older, which was significantly higher than the proportion of patients under 35 years of age ($p < 0.05$), their proportion in the age structure of the department was 2.0 times lower (32.2%). The mean age of the patient whose pregnancy was induced by ART was 37.00±0.30 years.

The study revealed (Fig. 1) that the most common age when infertility was diagnosed was 25–34 years (67.2%), which was significantly higher than the proportion of patients both under 25 years and over 35 years ($p < 0.05$). The mean age of infertility diagnosis in patients was 30.71±0.26 years.

Perinatal risk factors include infertility for 2–4 years and for 5 years or more. It was found that only 1.3% of the patients who overcame infertility with the help of ART were diagnosed with infertility for 1 year or less. The diagnosis period of 2–4 years occurred in 38.8% of women. More than half of the patients — 59.9% — had a diagnosis for 5 years or more, including 10–14 years — 19.0% and 15 years or more — 3.9%. The mean duration of infertility in patients was 6.18±0.19 years.

The type of infertility was of particular importance. "Primary infertility" was diagnosed in women who had no history of pregnancy despite regular sexual activity for a year without contraceptives. Secondary infertility is established in women who had a history of pregnancy but had not conceived during a year of regular sexual activity. Primary infertility was present in 61.0% of the patients whose pregnancies were induced by ART. Secondary infertility was diagnosed in 39.0% of the patients. The distribution of patients by type of infertility is shown in Figure 2.

Pregnancy occurred with the use of ART, refers to anamnestic risk factors, and the use of ICSI method in comparison with IVF has a higher number of perinatal risk scores. All patients in the study group became pregnant through IVF. Most of the patients had a history of one or two IVF attempts (43.9% and 23.2%, respectively). 32.9% of women had three or more attempts. On average, patients had 2.46±0.11 IVF attempts (Fig. 3).

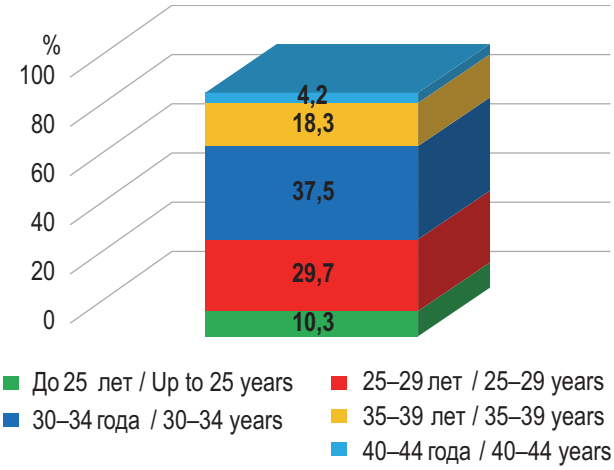

Fig. 1. Distribution of patients by the age of diagnosis of "infertility" made (in% of total)

Рис. 1. Распределение пациенток по возрасту постановки диагноза «бесплодие» (в% к итогу)

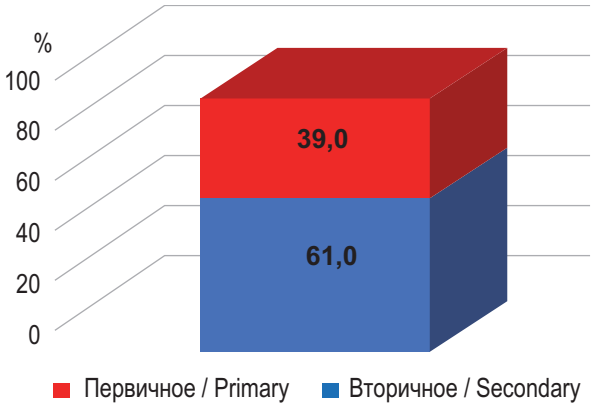

Fig. 2. Distribution of patients by type of infertility (in% of total)

Рис. 2. Распределение пациенток по виду бесплодия (в% к итогу)

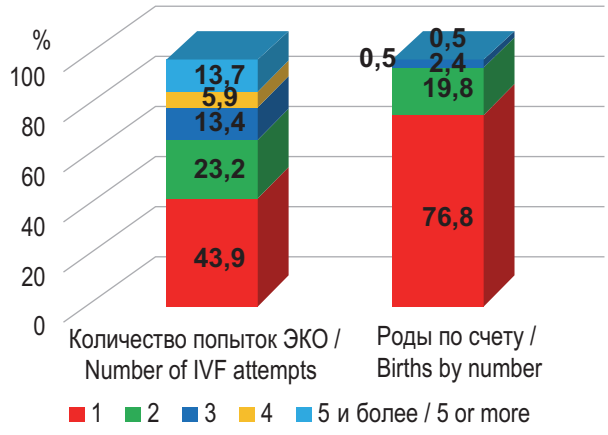

Fig. 3. Distribution of patients by number of IVF attempts and amount of births on the account (in% of total)

Рис. 3. Распределение пациенток по количеству попыток ЭКО и родов по счету (в% к итогу)

In addition, perinatal risk factors include obstetric and gynecological history of the mother, including parity of 4–7 births and 8 births or more. It was revealed that the majority of the studied contingent had first births as a result of ART (76.8%) and only 1.0% of patients had fourth births and more.

Assessment of the fetus takes a separate place in forming a strategy of perinatal risk factors. The study revealed that fetal pathology occurred in every fifth patient who overcame infertility with the help of ART (20.5%) (Fig. 4).

A history of abortion in a pregnant woman can also increase obstetric and perinatal risks. Abortion history was present in 41.5% of patients (Fig. 5). The majority of pregnancy terminations were related to maternal and fetal health (75.1%), including 44.5% of medically indicated abortions and 30.6% of spontaneous abortions. However, 24.9% of women had a history of medical legal abortion or voluntary termination of pregnancy. Considering that the proportion of elective abortions in the general population is 45.4%, and 58.5% of the patients in our study had no history of abortion, this type of pregnancy termination is not typical for women who overcame infertility with the help of ART. At the same time, the proportion of abortions for medical reasons in this category of pregnant women is 15.3 times higher than the national average (2.9% in Russia; $p < 0.05$), and the proportion of miscarriages is 1.5 times higher (20.0% in Russia; $p < 0.05$). The study showed that the proportion of abortions due to medically indicated undeveloped pregnancies was 22.5% of all abortions or 50.6% of medically indicated abortions.

Abortion in first-pregnant women is considered to be the most significant risk factor for perinatal pathology among abortions. Our study showed that 30.1% of the patients' first pregnancy ended with abortion. The percentage of abortions in first-pregnant women was 2.8 times higher than the average according to official statistics (10.8% in Russia; $p < 0.05$).

Every fifth woman had complications caused by infectious diseases, including covid or acute respiratory diseases (20.73 cases per 100 hospitalized patients). Whereas the most frequent diseases were gestational diabetes mellitus (30.49%) and pre-eclampsia (25.12%). Gestational diabetes mellitus was 1.7 times less frequent among pregnant women in the metropolis (17.71% in St. Petersburg; $p < 0.05$), and severe and moderate pre-eclampsia was 7.0 times less frequent (3.57% in St. Petersburg; $p < 0.05$).

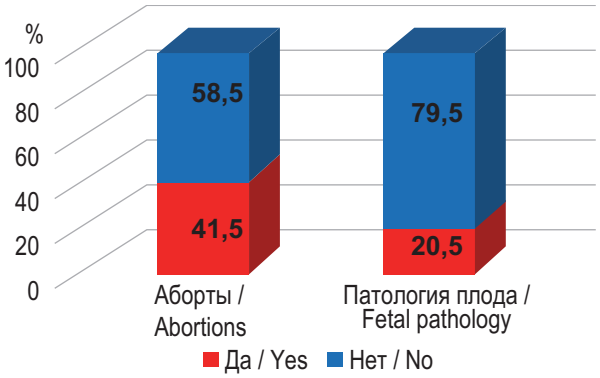

Fig. 4. Distribution of patients by history of abortion and fetal pathology in the current pregnancy (in% of total)

Рис. 4. Распределение пациенток по наличию абортов в анамнезе и патологии плода в настоящую беременность (в% к итогу)

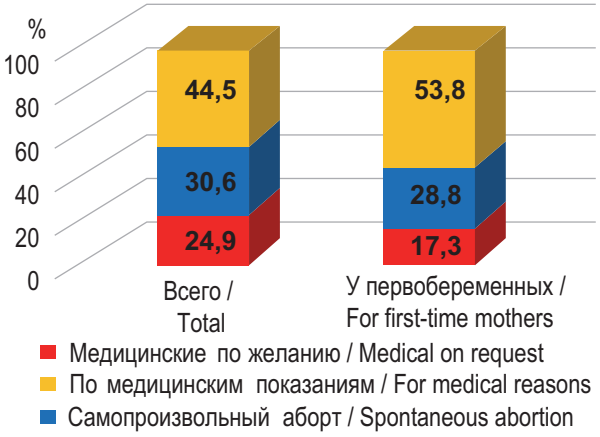

Fig. 5. Distribution of patients by type of abortion history (in% of total)

Рис. 5. Распределение пациенток по видам абортов в анамнезе (в% к итогу)

Extragenital maternal diseases are important obstetric and perinatal risk factors, namely: cardiovascular diseases (heart defects with and without circulatory disorders, chronic arterial hypertension stage I–II–III, varicose veins, hypotensive syndrome), kidney diseases, endocrinopathies (adrenal diseases, neuro-exchange endocrine syndrome, diabetes mellitus, thyroid diseases, obesity), anemia, myopia and other eye diseases, chronic specific infections (tuberculosis, brucellosis, toxoplasmosis, etc.), and coagulopathies [10]. It was found (Tables 1, 2) that myopia and anemia (40.73 and 38.78 per

Table 1

Frequency of pregnancy complications in patients (per 100 hospitalized patients who completed pregnancy)

Таблица 1

Частота осложнений беременности у пациенток (на 100 госпитализированных, закончивших беременность)

Нозологическая форма / Nosological form	Абс. / Abs.	В% / In%
Гестационный сахарный диабет / Gestational diabetes mellitus	250	30,49
Преэклампсия / Preeclampsia	206	25,12
Осложнения, вызванные инфекционными заболеваниями во время беременности (в том числе ковидом или острыми респираторными заболеваниями) / Complications caused by infectious diseases during pregnancy (including Covid or acute respiratory diseases)	170	20,73
Патология плаценты / Pathology of the placenta	152	18,54
Истмико-цервикальная недостаточность / Isthmic-cervical insufficiency	112	13,66
Маловодие / Low water	42	5,12
Многоводие / Polyhydramnios	30	3,66

100 hospitalized patients, respectively) and thyroid diseases (35.37%) were the most common extragenital diseases in the observed patients. It was found that endocrine diseases in these patients were 2.1 times more common than the average for pregnant women in St. Petersburg (17.17% in St. Petersburg; $p < 0.05$), venous complications were 1.6 times more common (14.5% in St. Petersburg; $p < 0.05$), and genitourinary diseases were 1.3 times more common (19.6% in St. Petersburg; $p < 0.05$).

The majority of patients in the Department of Pregnancy Pathology who overcame infertility with the help of ART had singleton pregnancies (88.8%). Multiple pregnancies occurred in 11.3% of pregnant women: two fetuses in 10.5% and three fetuses in 0.7%.

More than half of the women who became pregnant using ART (Fig. 6) delivered at term (65.9%). Accordingly, 34.5% of the patients underwent surgical delivery by caesarean section, of whom 18.4% had an emergency caesarean section (i.e. 184 per 1,000). Taking into account that caesarean section rate in St. Petersburg amounts to 270.8 operative deliveries per 1000 deliveries, caesarean section was used 1.5 times more often among this category of patients ($p < 0.05$).

Table 2

Frequency of extragenital pathology in patients (per 100 hospitalized patients who completed pregnancy)

Таблица 2

Частота экстрагенитальной патологии у пациенток (на 100 госпитализированных, закончивших беременность)

Нозологическая форма / Nosological form	Абс. / Abs.	В% / In%
Миопия / Myopia	334	40,73
Анемия / Anemia	318	38,78
Болезни эндокринной системы (заболевания щитовидной железы) / Diseases of the endocrine system (thyroid diseases)	290	35,37
Заболевания мочеполовой системы / Diseases of the genitourinary system	216	26,34
Варикозная болезнь / Varicose veins	194	23,66
Нарушение в системе гемостаза / Disturbance in the hemostasis system	150	18,29
Миома матки / Uterine fibroids	140	17,07
Прочие заболевания / Other diseases	412	50,24

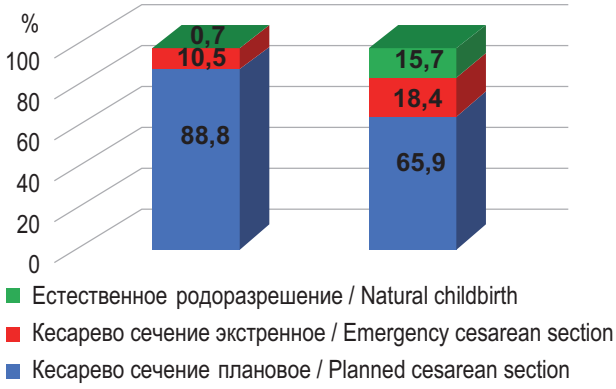

Fig. 6. Distribution of patients by number of fetuses and nature of delivery (% of total)

Рис. 6. Распределение пациенток количеству плодов и характеру родоразрешения (в% к итогу)

CONCLUSION

1. More than half of the patients had a pregnancy after the second or more IVF attempts (56.1%), in most cases it was the first birth (76.8%).

2. The proportion of patients of early reproductive age was more than half (67.8%), and 77.5% of women were diagnosed with infertility before the age of 35 years.

3. Most of the cases were primary infertility (61.0%). The mean age of primary infertility

was 30.04±2.72 years and secondary infertility was 31.04 ± 1.95 years.

4. More than half of the patients were diagnosed with infertility after 5 or more years of attempts without contraception (59.9%), and the mean age of infertility was 6.18±0.19 years.

5. 41.5% of women had a history of abortion. The proportion of abortions for medical reasons in this category of patients was higher than the population average by 15.3 times, spontaneous abortions by 1.5 times, and abortions in first-pregnant women by 2.8 times.

6. The most common complications of pregnancy were gestational diabetes mellitus, pre-eclampsia and complications due to infectious diseases during pregnancy. The most common extragenital pathologies in the patients were myopia, anemia and thyroid diseases. Fetal pathology was detected in 20.5% of the patients.

7. In comparison with the morbidity of metropolitan pregnant women, these patients suffered from severe and moderate pre-eclampsia 7.0 times more often, from gestational diabetes mellitus — 1.7 times more often, endocrine system diseases — 2.1 times, venous complications — 1.6 times, genitourinary system diseases — 1.3 times.

8. The most frequent reasons for hospitalization were caesarean section delivery (44.6%) and premature delivery (25.9%). Only 15.7% of IVF patients had natural delivery.

Thus, the study revealed that patients who underwent IVF had a significant number of obstetric and perinatal risk factors. It demands from obstetricians and gynecologists to focus more attention on the course of pregnancy and childbirth in this category of patients.

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.

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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UDC 616-002.5, 614.442
DOI: 10.56871/MHCO.2024.39.41.002

INDICATORS OF THE ASSESSMENT OF TERRITORIAL ENVIRONMENT IN THE WORK OF DISTRICT SERVICES OF OUTPATIENT MEDICAL ORGANIZATIONS

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For citation: Bozhkov IA, Korneva NV, Silidi IYu, Privalova MA, Sterlikov SA, Sevastiyanov MA, Balasanyants GS. Indicators of the assessment of territorial environment in the work of district services of outpatient medical organizations. Medicine and Health Care Organization. 2024;9(2):14–25. DOI: https://doi.org/10.56871/MHCO.2024.39.41.002

Received: 02.06.2024 ***Revised: 25.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. The practical application by medical workers of various local services of existing mechanisms of interdisciplinary interaction to conduct a comprehensive assessment of the patient's problems is difficult due to lack of uniform approaches described in methodological recommendations containing routing and algorithms for interaction with non-medical specialists. The purpose of this study is to examine the possible influence of territorial objects and factors on the spread of tuberculosis infection in concern with the work of local services. From January 2021 to June 2022, a retrospective analytical descriptive study was conducted on the basis Anti-tuberculosis dispensary № 5. Based on the example of the territory of the Kalininsky and Krasnogvardeysky administrative districts, it was established that the incidence and prevalence of tuberculosis differed by several times in different municipalities. A comparative analysis of indicators states the heterogeneity of microterritories in municipalities according to a number of territorial factors and objects, as well as "points of attraction". According to the results of multivariate analysis, the independent factor that may cause presence of a focus of tuberculosis infection on a particular territory was density of the residents. It can be concluded that the higher the population density, the higher the likelihood that the TITR will not be "Clean" (aOR = 1.0002, p <0.001). Thus, in the work of local departments, when assessing the development of tuberculosis infection, it is necessary to take into account the influence of territorial objects and factors, especially population density. Creating a microterritorial profile based on dividing territories according to the principles of a geographic field allows for a more detailed assessment of the epidemic situation and work out effective organizational and management decisions (EMD) regarding the management of patients of various gender, age and social groups, including patients with socially significant diseases (SSD) and disabled persons.

KEYWORDS: boundaries of the territory, medical geography, International Classification of Functioning, Disability and Health (ICF), distribution, organization of health care, focus of tuberculosis, sanitary prevention, socially significant diseases, territory, territorial objects, tuberculosis, epidemiology

ПОКАЗАТЕЛИ ОЦЕНКИ ТЕРРИТОРИАЛЬНОЙ СРЕДЫ В РАБОТЕ УЧАСТКОВЫХ СЛУЖБ АМБУЛАТОРНЫХ МЕДИЦИНСКИХ ОРГАНИЗАЦИЙ

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Для цитирования: Божков И.А., Корнева Н.В., Силиди И.Ю., Привалова М.А., Стерликов С.А., Севастьянов М.А., Баласанянц Г.С. Показатели оценки территориальной среды в работе участковых служб амбулаторных медицинских организаций // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 14–25. DOI: https://doi.org/10.56871/MHCO.2024.39.41.002

Поступила: 02.06.2024 ***Одобрена: 25.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. Практическое применение медицинскими работниками различных участковых служб существующих механизмов междисциплинарного взаимодействия для проведения комплексной оценки проблем пациента затруднено ввиду отсутствия единых подходов и алгоритмов, описанных в методических рекомендациях, в том числе при взаимодействии со специалистами немедицинского профиля. Цель настоящего исследования — изучение влияния территориальных объектов и факторов на показатели распространения туберкулезной инфекции в работе участковых служб. С января 2021 г. по июнь 2022 г. проведено ретроспективное аналитическое описательное исследование на базе СПб ГБУЗ «Противотуберкулезный диспансер № 5» (ПТД № 5). На примере территории Калининского и Красногвардейского административных районов установлено, что показатели заболеваемости и распространенности туберкулеза отличались в несколько раз в разных муниципальных образованиях. Сравнительный анализ показателей свидетельствует о неоднородности микротерриторий в муниципальных образованиях по ряду территориальных параметров и объектов, а также мест регулярного скопления людей, являющихся «точками притяжения». По результатам многофакторного анализа независимым критерием, влияющим на вероятность наличия на территории очага туберкулезной инфекции, оказалась плотность проживающего населения. Можно сделать вывод, что чем выше плотность населения, тем выше вероятность того, что территория

инфекционного туберкулезного риска не будет «чистой» (aOR = 1,0002, p <0,001). Таким образом, в работе участковых подразделений при оценке развития туберкулезной инфекции необходимо учитывать влияние территориальных объектов и факторов, особенно плотности населения. Создание микротерриториального профиля на основании деления территорий по принципам географического поля позволяет более детально оценить эпидемическую ситуацию и принять эффективные организационно-управленческие решения в части ведения пациентов различных половозрастных и социальных групп, включая больных социально значимыми заболеваниями и лиц с инвалидностью.

КЛЮЧЕВЫЕ СЛОВА: границы территории, медицинская география, международная классификация функционирования, распространение, организация здравоохранения, очаг туберкулеза, санитарная профилактика, социально-значимые заболевания, территория, территориальные объекты, туберкулез, эпидемиология

INTRODUCTION

Article 7 of the Constitution of the Russian Federation and Federal Law No. 323-F3 of 21.11.2011 “On the Fundamentals of Health Protection of Citizens in the Russian Federation” state that the Russian Federation (RF) is a social state and one of its priorities is the protection of human health. It has a complex and systemic character, and includes sanitary and anti-epidemic measures, which are carried out to preserve the mental, physical, social and territorial well-being of citizens on the territory of their residence. Territorial well-being can be understood as various components of the environment balanced in the local measurement, which contribute to self-fulfillment of a healthy, safe, spiritual, value-rich and peaceful way of life for people living on a certain territory permanently and/or temporarily. Territorial well-being is based on the normative and legal acts which are valid in the country and/or the region. Outpatient medical organizations (OMOs) can attribute these functions to activities of district units and OMO epidemiologists. For example, a district phthisiologist is a key figure in tuberculosis control activities and is actively involved in both various responsibilities of inpatient work, as well as focuses on outpatient sections of tuberculosis (TB) care. Work in tuberculosis hotspots (TBH) has always remained the section of TB care in the public health system. Within the framework of this work, interdepartmental cooperation with other territorial and district services was both possible and necessary, and its mandatory nature was legally stipulated.

Analysis of literature data highlights several key points that are relevant for urban areas and important for the effectiveness of current and prognostic assessments of TB spread and anti-epidemic activities.

1. Specialists from different fields, administration, and population should understand the importance of common values, goals and objectives in a shared territory, in order to increase the trust which is necessary for effective and timely implementation of preventive and anti-epidemic measures.

2. It is advisable to identify geographical territorial boundaries, parameters and objects (schools, stops, medical organizations, population density, etc.) that form the unique profile of a micro-territory/territory during TB development, which reflect the spatial and temporal features of the population’s environment and may change, for example, when TB patients move between territories.

Accordingly, a passport of district physicians should include a comprehensive spatial and temporal territorial assessment of the epidemic situation and characteristics of tuberculosis infection hotspots within certain boundaries, because otherwise further outpatient work of district phthisiologists remains insufficient.

According to the Procedure for Organizing Medical Rehabilitation of Adults (No. 788n, Approved by Order of the Ministry of Health of the Russian Federation on the 31 July 2020), the use of the International Classification of Functioning, Disability and Health (ICF) is mandatory in rehabilitation work [1]. Environmental factors, including territorial objects, are a component of the ICF and refer to all aspects of the surrounding (or external) world, which forms the living conditions of an individual and thus affects his or her functioning. For example, demographic changes, population density, professional health

care workers also belong to environmental factors. To standardize the description of functional ability, health and disability of patients with different diseases, different tools based on the ICFs are being developed. They include the ICF Core Sets (ICF CSs), a short list of the ICF categories which are considered to be the most appropriate for describing the functioning of people with different health conditions, in a particular situation and a territory of residence. Patient's health status is assessed across all domains of the Core Sets and implemented into an individualized functioning profile. At present, the ICF CS is not available in phthisiology and requires further development.

AIM

To study the way territorial objects and micro-territorial distribution principal influence on TB infection rates in a metropolis. This influence is observed taking into account the interaction of district phthisiologist service with specialists of the general medical network (GMN), population, municipal and administrative services.

MATERIALS AND METHODS

A retrospective analytical descriptive study was conducted between January 2021 and June 2022. The data obtained were analyzed on the basis of tuberculosis early treatment and prevention center (TETPC) No. 5.

Inclusion criteria. Adult patients aged 18 years and older with active tuberculosis (A 15.0 — A 19.0) and children and adolescents diagnosed with latent tuberculosis infection (R 76.1), enrolled for outpatient care at the TETPC No. 5 between 2012 and 2021. All patients lived in the Kalininsky and Krasnogvardeysky districts of St. Petersburg (SPb). The study was based on geo-spatial, geo-situational, comparative-geographical and problem-program scientific approaches, methods of statistical analysis, thematic mapping and on GIS-technologies.

We have developed and used a biomedical geographical approach (BMGA) to bring knowledge and skills to a "common denominator" (Fig. 1). BMGA development was based on the common interests of residents, agencies and professional community in the territory to ensure territorial well-being [2, 3].

Implementation of labour functions by the medical and non-medical territorial community, which are part of the BMG team, is based on common work of phthisiologists and primary care physicians when they deal with socially significant diseases (SSDs) in accordance with the List of socially significant diseases and diseases that pose a danger to others, which includes tuberculosis, approved by the Russian Government Decree No. 715 dated 01.12.2004, as well as with the provisions of professional standards (PS) and other regulatory legal acts (RLAs).

It was necessary to define optimal spatial and temporal boundaries that could be easily identified and used for the work of various types of neighbourhood services when using the BMGs in the micro-territory.

The first stage involved field research of the territory in the studied districts. They were divided according to the actual administrative

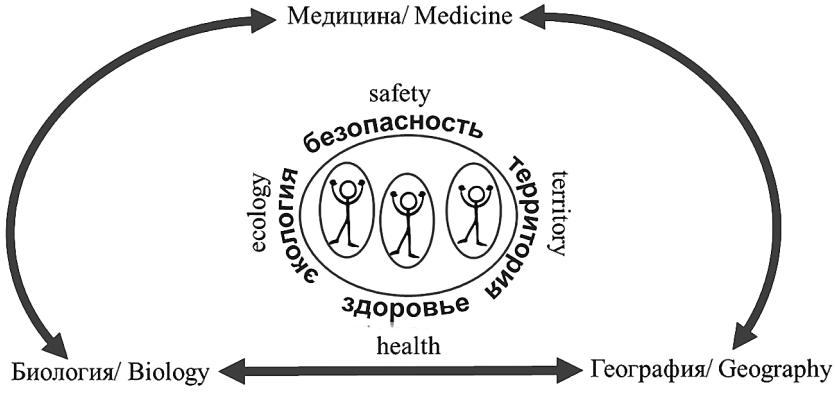

Fig. 1. Interaction scheme in accordance with the BMG approach

Рис. 1. Схема взаимодействия в рамках БМГ-подхода

division into 12 municipal districts (MD), for which there are statistical data and defined and consistent boundaries [4–6]. These boundaries were established by the Federal Law No. 131-FZ, dated 06.10.2003 "On General Principles of Organization of Local Self-Government in the Russian Federation". The total area of the research covered 96.5 km^2, the population amounted to 943,927 people living in 2,889 residential buildings by the moment of the research. The information about the places of public and social attraction in small areas, marked on the city map, was verified and supplemented by volunteer schoolchildren from St. Petersburg State Budgetary Educational School No. 214 and No. 192. The pupils were supervised by the authors of the article, and the collected materials were processed. The administration of the municipal district (MD) provided additional information on the demographic situation, the number and employment of the population, vertical and horizontal parameters of houses, infrastructural, social and engineering conditions of the territory, including squares and streets; if necessary, it was clarified in management companies (MC), homeowners' associations (HOA), housing and communal services (HCS).

At the second stage, an analysis of epidemiological indicators was conducted, characterizing the TB epidemic situation (morbidity, mortality, prevalence, etc.) for each MD.

The TETPC No. 5. provided data on children and adults with tuberculosis, as well as children and adolescents with latent tuberculosis infection (LTI), the information included places of their residence. The number of all active TB cases for 10 years (from 2012 to 2021) and the number of active TB cases and LTI at the end of the first half of 2022 were analyzed.

For instance, the Kalininskiy administrative district has approximately homogeneous infrastructure and time of construction. It was established that tuberculosis incidence and prevalence rates differed multiply in different municipal districts and did not reflect reasons for the spread of tuberculosis infection (Table 1).

According to the principles of geographic field definition [7, 8], boundary lines were identified in naturally existing borders of administrative territories: streets, squares, parks, rivers, railway tracks. These borders were used to draw the boundaries of micro-territories with approximately the same statistical MD surface for further study. Such territorial units were called territories of infectious tuberculosis risk (TITR) [4, 5]. They corresponded to residential neighborhoods, including residential and non-residential buildings, and differed from them by having non-residential buildings and/or designated park areas. The characteristics of the TITRs are presented in Table 2.

Stage 3 involved implementation of an organizational and management solution (OMS) to align the boundaries of TB sites according to the district boundaries in order to improve interdisciplinary collaboration [4–6]. The staffing ratios recommended by the Order on the Provision of Medical Care to Patients with Tuberculosis, approved by Order No. 932n of the Ministry of Health of the Russian Federation of 15 November 2012 (the Order), could be met by several TB sites or by several small micro-territories managed by a single phthisiologist in large MDs. Territorial facilities and indicators were divided into 4 groups (demographic, epidemic, community and social) and included: population density/households/apartments, presence and density of medical organizations, schools, kindergartens, recreational areas, public transport stops, number of patients with latent tuberculosis, TB hotspots and others.

Differences between the three described TITR groups ("null" groups were excluded) were determined using the Kraskell–Wallis test, since the distribution of all comparable characteristics differed from the normal distribution; the critical p value was taken as 0.142 for the three groups, corresponding to a 5% chance of statistical error of the first kind [9]. When the null hypothesis was rejected for the chosen level of statistical significance, the Mann–Whitney test with the same critical level of significance p was additionally performed between the groups.

At the fourth stage, we analyzed the legislation regulating functional responsibilities of district service doctors. These responsibilities include sanitary and epidemiological monitoring of the supervised territories, interdepartmental cooperation, compilation of a "site passport", and implementation of the ICF in practice. A set of domains for contextual factors that can limit or facilitate the process of treatment and rehabilitation of TB patients was developed. It was based on the analysis of tuberculosis risk factors, social anamnesis and epidemiological studies of tuberculosis hotspots in the analyzed districts.

Table 1

Tuberculosis incidence and prevalence data of municipal Kalininsky district of St. Petersburg at June 30, 2022

Таблица 1

Данные заболеваемости и распространенности туберкулеза по муниципальным округам Калининского района СПб на 30.06.2022 г.

Показатели / Indicators	Муниципальный округ / Municipal district						
	Северное / Severnoe	Академическое / Akademicheskoye	МО 21/ MD 21	Пискаревский / Piskarevskiy	Финляндский / Finlandskiy	Прометей / Prometey	Гражданка / Grazhdanka
Заболеваемость (на 100 тыс. населения) / Incidence (per 100 000 population)	4,1	9,3	1,3	7,8	9,9	10,2	10,9
Распространенность (на 100 тыс. населения) / Prevalence (per 100 000 population)	39,4	36,0	16,9	15,7	25,4	35,8	27,2
ЛТИ (число случаев на 1 км²) / LTBI (number per 1 km²)	3	1,3	1,8	1,4	0,9	3,5	2,9
Очаги туберкулеза (число очагов на 1 км²) / TB hotspots (number per 1 km²)	9	5	3,3	1,5	1,8	7	4,9

Table 2

Characteristics of AITR

Таблица 2

Характеристика ТИТР

Название / Name	Определение / Definition	Число / Number	Площадь / Area
Нулевые / Zero	Территории, свободные от жилой застройки / Areas free from residential buildings	25	30,6
«Чистые» / «Clean»	Территории, свободные от ОТБ / Areas free from tuberculosis patients	33	21,6
Чувствительные / Sensitive	Территории с долей ОТБ с множественной и широкой лекарственной устойчивостью (МЛУ и ШЛУ) микобактерий туберкулеза менее 70% / Areas where MDR and XDR tuberculosis patients are less than 70%	47	25,2
Резистентные / Resistant	Территории с долей ОТБ с МЛУ и ШЛУ микобактерий туберкулеза 70% и более / Areas where MDR and XDR tuberculosis patients are 70% and more	36	19,1

Note: AITR — areas of infectious tuberculosis risk.

Примечание: ОТБ — очаги туберкулеза; ТИТР — территории инфекционного туберкулезного риска.

RESULTS

Comparison of TITR types by a number of indicators revealed the following reliable statistically significant differences:

a) "clean" TITRs and TITRs of other types differed by density of adult and child population living in the area, density of houses and flats in houses, density of shops, educational and medical institutions, recreation areas;
b) the density of public transport stops in "clean" and multidrug-resistant tuberculosis areas also varied (p=0.004);
c) the density of latent tuberculosis infection between "clean" TITR and sensitive tuberculosis differed (p <0.0001).

The hypothesis on the influence of houses age and floor size was not confirmed; this can be interpreted as epidemiological insignificance of Mycobacterium tuberculosis inhabitation in environmental objects.

Thus, the given data testify to heterogeneity of micro-territories of the modern megapolis within the allocated boundaries. According to the results of multivariate analysis, an independent variable influencing the probability of tuberculosis infection on a certain territory turned out to be the population density in a micro-territory. Taking into account the transformation of megacities into urban agglomerations and the absence of generally accepted principles of territorial development, it is possible to assume that further growth of housing construction rates and "densification" of urban

development will increase risks of TB spread. It can be concluded that higher population density will raise the chances of making "clean" TITRs infected (aOR=1.0002, p <0.001). The ROC analysis performed established a high predictive ability of the model, the area under the curve accounted for 90.3%. The optimal cut-off point, at which the probability of having a center of TB infection was higher than its absence, corresponded to an adult population density of 8460 per km^2. The influence of other microgeographic field factors was relatively low in relation to population density.

According to the data from statistical forms (f-033, f-8), in 2020–2022 organizational and management solutions (OMS) together with a biomedical geographical approach (BMGA) were aimed at improving the interaction and subsequently allowed to: reduce the number of patients evading examination and necessary treatment by 3.2 times (from 92 people to 29); increase the coverage of examined patients in contact with TB patients by 82% per one detected patient; to achieve bacteriological cessation in 72.6% of all patients detected with TB for the first time, taking into account MDR (multiple drug-resistant tuberculosis) and XDR (extensively drug-resistant tuberculosis) (56.8% in St. Petersburg); to increase medical literacy of the population starting from school age ("Health Relay Race" in district schools), which resulted in a 25% reduction in parental refusal to examine children for TB.

In addition, the approaches used made it possible to significantly reduce the territorial TB incidence rate (Table 3) compared to the similar rate in St. Petersburg (per 100,000, 2018–2021).

Table 3

Comparision Tuberculosis incidence in TB Dispensary N 5 and St. Petersburg

Таблица 3

Сравнение заболеваемости туберкулезом ПТД № 5 и СПб

Территория / Area	Годы			
	2018	2019	2020	2021
Санкт-Петербург / Saint Petersburg	29,1	25,8	24,7	21,2
СПбГБУЗ «ПТД № 5» / Antituberculosis dispensary № 5	28,1	20,2	19,2	15,4

DISCUSSION

The professional standard "Phthisiologist", approved by the order of the Ministry of Labor of Russia from 31.10.2018 No. 684n, indicates the obligation to carry out sanitary and anti-epidemic (preventive) measures in tuberculosis hotspots, taking into account their epidemic danger, as well as to assess the effectiveness indicators of anti-tuberculosis measures. These activities should be based on interdepartmental and interdisciplinary cooperation in a certain territory in order to detect tuberculosis in adults and children as early as possible. In addition, mandatory Labor actions and skills include conducting health education to prevent the spread of tuberculosis among the population, informing the population about possible risks of tuberculosis, and monitoring of tuberculosis patients and individuals at high risk in a certain district.

Labor functions of district specialists are common when dealing with prevention of socially significant diseases. Preventive and rehabilitation measures are based on the district principle (DP) as well as on the interdisciplinary interaction of general practitioners, physicians, pediatricians, phthisiologists [2, 6, 10, 11]. Their responsibilities are based on the provisions of professional standards: Draft Order of the Ministry of Labor and Social Protection of the Russian Federation 'On approval of the professional standard "General practitioner" (prepared by the Ministry of Labor of Russia on 27.11.2018) — for general practitioner; Order of the Ministry of Labor of Russia dated 31.10.2018, No. 684n 'On approval of the professional standard "Physician-phthisiologist" for phthisiologists; Order of the Russian Ministry of Labor of 27.03.2017, No. 306n "On approval of the professional standard 'District pediatrician' — for pediatricians; and Order of the Ministry of Health and Social Development of the Russian Federation of 07.12.2005, No. 765 "On organization of the activity of district therapist" — for district therapists.

However, the level of medical service may significantly differ between various tuberculosis early treatment and prevention centers (TETPCs) and even within the same TETPC, since there are no generally accepted criteria for determining the territorial boundaries of TETPCs. This fact is reflected in the Annex No. 2 of the Order which specifies recommended staffing levels for urban and rural areas based on the number of population (1 district TB doctor per 25,000 urban residents and 13,300 rural residents). It allows heads of medical organizations to determine the workload of district physicians freely enough and do

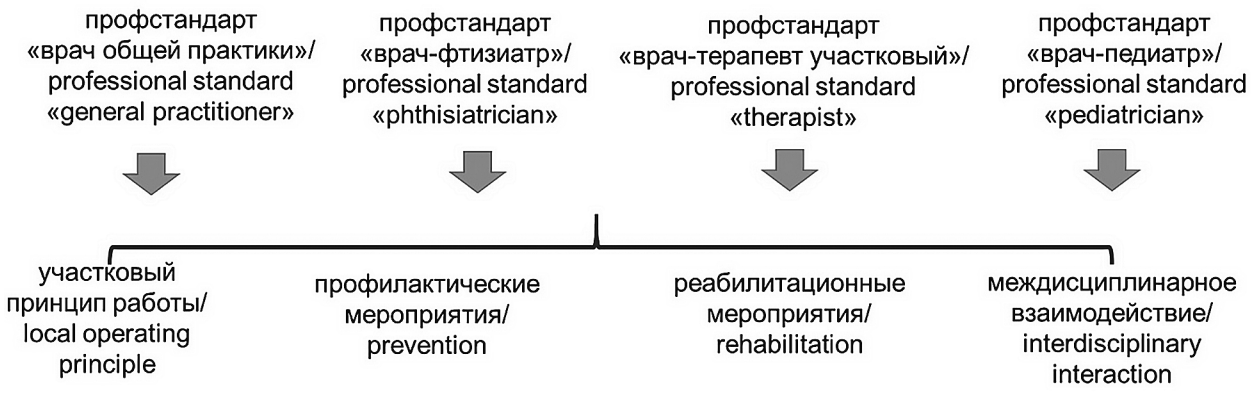

Fig. 2. Principles of the multidisciplinary interaction of medical territorial specialists

Рис. 2. Принципы междисциплинарного взаимодействия участковых специалистов

not take into account the population density of the area served. Accordingly, the Provisions of Order of the Ministry of Health and Social Development of the Russian Federation No. 543n, dated 15.05.2012 'On Approval of Regulations concerning Organization of Primary Health Care for Adults' do not have generally accepted approaches to territorial assessment. The Provisions require to consider the population density when providing specialized primary health care in outpatient medical organizations. Unfortunately, this provision is not widely implemented. Thus, a simple division of TB sites based on the number of attached population according to the Order does not comply with provisions of regulatory and legal documentation and requires the use of population density indicators by medical organizations, since there are modern conditions of urban agglomerations, migration turbulence, and dense construction. The impact of population density on the spread of tuberculosis should be taken into account as well. Under the Order No. 932n of the Ministry of Health of the Russian Federation dated 15.11.2012, the number of attached population of a district phthisiologist corresponds to the attached population of more than ten district physicians (pediatricians) or family physicians/general practitioners in accordance with the Order No. 543n of the Ministry of Health and Social Development of the Russian Federation dated 15.05.2012. Consequently, timely and well-coordinated interdisciplinary interaction of the district service in outpatient medical organizations becomes extremely important.

Another important factor in the work of TB district services is the absence of the most generally accepted concept of "site passport" among phthisiologists, in contrast to the "passportisation" of district general practitioners "On the organization of district general practitioner activity" issued 07.12.2005 by the Order No. 765 of the Ministry of Health and Social Development of the Russian Federation) and pediatricians ("On the passport of the medical district (pediatrician") issued 09.02.2007 by the Order No. 102 of the Ministry of Health and Social Development of the Russian Federation). The passport of a doctor's area is designed to obtain information on the attached contingent, gender, age and social composition. For example, the passport of a district general practitioner indicates that a general practitioner carries out detection of early and latent forms of diseases, which should be performed taking into account territorial assessment and interaction with other district services.

The principle of site formation based on the number of attached population is imperfect in modern conditions.

Existing discrepancies with regard to served territories may be the cause of inefficient interdisciplinary and interdepartmental cooperation. There is a requirement to specify only the name of an urban locality when describing the "location" of a therapeutic area, while a pediatric area must include both the name of a locality and addresses of houses, as well as the availability of transport. These discrepancies do not contribute to interaction with the TB service in hotspots. For example, the Housing Code of the Russian Federation dated 29.12.2004, No. 188-FZ, Article 36 "Ownership of the common property of owners of premises in an apartment building" defines the adjacent territory as "...the land plot on which the building is located, with

elements of landscaping, other objects intended for maintenance, operation and improvement of the building and objects located on the land plot". The boundaries and size of the land plot on which an apartment building is located are determined in accordance with requirements of land legislation and legislation on town-planning activities. Accordingly, when defining the territory of the "common yard", which can be formed by a group of apartment buildings with different adjacent territories and, possibly, with different organizational forms of management of this territory (HOA, MC, etc.) different assessments and approaches can be used. They depend on representatives of homeowners and, as a consequence, they are financed by owners and certain anti-epidemic measures become dispensable. These facts have been encountered in the course of our work. Besides, organizing activities for people with disabilities, including children with disabilities, is often difficult for both social and territorial reasons. In most cases, only a small proportion of children with disabilities are observed by a phthisiologist. These children need a special approach to examination and medical check-ups due to the insufficiency of regular screening tests, parental refusal of preventive treatment, and poor tolerance of drugs. Therefore, district pediatricians should pay closer attention to such children in order to individualize diagnosis and treatment, as well as to monitor their coverage with TB interventions. For children with contraindicated or uninformative skin tests, routine screening with IGRA tests should be provided [6].

Another important area of any district specialist's activity is working with patients with socially significant diseases [12, 13]. For phthisiologists, these are patients with comorbid and combined pathology [14] of different groups of regular medical monitoring, approved by the order of the Ministry of Health of Russia from 13.03.2019 No. 127n "On approval of the order of regular medical monitoring of patients with tuberculosis...". First of all, chronic non-infectious diseases include chronic obstructive pulmonary disease (COPD), cerebrovascular and cardiovascular diseases. In accordance with Order No. 765 of the Ministry of Health and Social Development of the Russian Federation dated 07.12.2005 "On the organization of the activity of the district physician", the district physician can refer a patient to other medical institutions for consultation or inpatient treatment, with subsequent supervision of a patient after his treatment has been finished. Currently, a unified state information health care system (USIHCS) is being actively implemented, which allows to maintain continuity between a hospital and polyclinic in accordance with the Decree of the Government of the Russian Federation No. 140 of 09.02.2022 "On a unified state information system in the sphere of health care".

Special attention should be paid to the territories where houses and residential homes for the elderly and disabled are located when issues of sanitary and epidemiologic well-being are considered at the level of regions and local communities. High average age, limitations in self-care and independent movement of residents, as well as high comorbidity index, crowdedness/density of residence are the main predisposing factors to the development of hazardous socially significant diseases, including tuberculosis [15]. This fact was widely confirmed by the pandemic of coronavirus infection. For instance, according to WHO data from 23.04.2020, up to half of deaths from coronavirus in Europe occurred in nursing homes [16]. Since collective immunity is not formed in tuberculosis, and the vaccine does not fully protect against infection, the main ways to eliminate the disease are active detection and treatment of patients [17]. According to the Order of the Ministry of Health of Russia from 02.05.2023 No. 202n "On approving the list of medical contraindications, ..., as well as the form of authorized medical organization on the presence (absence) of such contraindications", tuberculosis of any organs and systems with bacterial excretion is a contraindication for provision of social services at home, in semi-stationary and stationary forms. Accordingly, the interaction of district services in the territories of boarding houses and residential homes for the elderly and disabled should be as effective as possible, which will prevent outbreaks of tuberculosis infection.

Many authors note the necessity to increase TB vigilance and strengthen TB work of physicians [6, 18, 19], which is also reflected in the Decree of the Chief State Sanitary Doctor of the Russian Federation No. 4 of 28.01.2021 [9], but the specific reasons for the decrease in TB vigilance are not specified, although they directly depend on the quality of out-of-discharge work performed by district phthisiologists. Seminars and lectures on tuberculosis prevention and early diagnosis have a positive role [18–20]. Nevertheless, absence or insufficiency of systematic interaction

between services and non-performance / poor quality of routine outpatient monitoring of district phtisiologists is accompanied by low awareness. Psychological unavailability of specialists hinders implementation of measures to prevent and detect tuberculosis. It also influences on the joint work in TB hotspots which may be related to the lack of unified principles and approaches to TB prevention and early diagnostics.

The distribution of epidemic processes in a territory may be different and uneven, which requires a more detailed assessment of the micro-territorial epidemiologic situation and definition of principles, approaches and workload depending on these features. Accordingly, every pediatric and adult district phthisiologists faces a specific epidemic picture of tuberculosis in each TB district in his/her daily practice. This view is also reflected in a number of scientific papers that point to the underestimation of territorial contacts [19]. Perhaps, the creation of an individual profile of micro-territories in the city may be an integral part of effective interaction between the population, administrations of different levels and medical organizations and serves as a basis for the development of information vertical in decision-making to achieve results in timely TB control activities in different territories. It is necessary to introduce the ICF [1], which is implemented in other areas of medicine. The ICF will make it possible to supervise patients both by a district phthisiologist and other specialists on the basis of an individual program.

CONCLUSION

According to the above mentioned, it is necessary:

- to use the presented predictive model for planning the development and resettlement of tuberculosis patients in micro-territories involving phthisiologists;
- to form unified approaches to carry out preventive and anti-epidemic measures in one TB district, which will be based on the BMGA and involve phthisiologists, general medical network, administration and population, taking into account the heterogeneity of tuberculosis infection spread in the territories;
- to assess the risk of TB infection spread, taking into account the influence of territorial facilities and factors, including population density, as well as ICF barriers as a tool for describing and dynamically controlling medical, social, psychological, community and territorial characteristics of the population served;
- to create a micro-territorial profile based on the division of territories according to the principles of geographic field, which will allow to assess the epidemic situation in detail and adopt effective organizational and management solutions for the management of patients of different groups, including patients with SSDs and disabilities;
- to have common quantitative and qualitative benchmarks, including territorial ones, to prevent the development of tuberculosis infection.

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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UDC 614.23:616.9-470.620
DOI: 10.56871/MHCO.2024.17.81.003

SOCIAL AND HYGIENIC PORTRAIT OF INFECTIOUS DISEASES DOCTORS WORKING IN MEDICAL ORGANIZATIONS OF THE SOUTHERN REGIONS OF THE RUSSIAN FEDERATION

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For citation: Nesterenko NV, Redko AN, Gorodin VN. Social and hygienic portrait of infectious diseases doctors working in medical organizations of the southern regions of the Russian Federation. Medicine and Health Care Organization. 2024;9(2):26–36. DOI: https://doi.org/10.56871/MHCO.2024.17.81.003

Received: 17.05.2024 ***Revised: 21.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. The article presents the results of an anonymous survey of 262 infectious diseases doctors working in state medical organizations providing assistance in the field of "Infectious diseases" in the subjects of the Russian Federation, which are part of the Southern and North Caucasian Federal Districts. Statistical analysis was carried out using the SPSS Statistics 26 program (IBM Corp., 2018), the Chi-square test, including the Yates correction. The socio-hygienic portrait of an infectious diseases doctor included demographic and socio-economic characteristics, peculiar aspects of the professional activity, features of health and psycho-emotional status, assessment of factors of professional activity. The respondents identified the key problems they are faced to in the course of their work. A large amount of workload was noted caused by the lack of an adequate number of staff according to the staffing table requirements; scarce prestige of the profession and low wages. Infectious diseases doctors stressed harmful working conditions that negatively affect their health, high levels of stress in the workplace, which in turn lead to the formation of professional burnout. The results of the study indicate the need to make comprehensive management decisions aimed at ensuring a sufficient number of medical personnel based on increasing the motivation of specialists, developing social support measures, including attracting and retaining already working infectious diseases doctors in the profession.

KEYWORDS: infectious disease doctor, social and hygienic portrait, sociology of medicine, healthcare, professional burnout

СОЦИАЛЬНО-ГИГИЕНИЧЕСКИЙ ПОРТРЕТ ВРАЧЕЙ-ИНФЕКЦИОНИСТОВ, РАБОТАЮЩИХ В МЕДИЦИНСКИХ ОРГАНИЗАЦИЯХ ЮЖНЫХ РЕГИОНОВ РОССИЙСКОЙ ФЕДЕРАЦИИ

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Для цитирования: Нестеренко Н.В., Редько А.Н., Городин В.Н. Социально-гигиенический портрет врачей-инфекционистов, работающих в медицинских организациях южных регионов Российской Федерации // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 26–36. DOI: https://doi.org/10.56871/MHCO.2024.17.81.003

Поступила: 17.05.2024 ***Одобрена: 21.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. В статье представлены результаты анонимного опроса 262 врачей-инфекционистов, работающих в государственных медицинских организациях, оказывающих помощь по профилю «инфекционные болезни», в субъектах Российской Федерации, входящих в состав Южного и Северо-Кавказского федеральных округов. Статистический анализ осуществлялся с помощью программы SPSS Statistics 26 (IBM Corp., 2018), теста χ^2, в том числе с поправкой Йейтса. Социально-гигиенический портрет врача-инфекциониста включал демографические и социально-экономические характеристики, аспекты профессиональной траектории, особенности здоровья и психоэмоционального статуса, оценку факторов профессиональной деятельности. Респондентами выделены ключевые проблемы, с которыми они сталкиваются в процессе трудовой деятельности. Отмечен большой объем нагрузки из-за отсутствия должного количества кадров по штатному расписанию; недостаточный престиж профессии и низкая заработная плата. Врачи-инфекционисты указали на вредные условия труда, негативно влияющие на состояние их здоровья, высокий уровень стресса на рабочем месте, который в свою очередь ведет к формированию профессионального выгорания. Результаты исследования свидетельствуют о необходимости принятия комплексных управленческих решений, направленных на обеспечение достаточного количества врачебных кадров на основе повышения мотивации специалистов, разработки мер социальной поддержки, в том числе по привлечению и удержанию в профессии уже работающих врачей-инфекционистов.

КЛЮЧЕВЫЕ СЛОВА: врач-инфекционист, социально-гигиенический портрет, социология медицины, здравоохранение, врачебные кадры

INTRODUCTION

Under Presidential Decree No. 254 dated 6 June 2019 “On the Strategy for the Development of Health Care in the Russian Federation for the period until 2025”, a top priority is to increase availability of medical care provided to population in medical organizations and to eliminate the staff shortage. This is also a key task of the National Project “Health Care” [1, 2].

Taking into account existing problems of medical personnel imbalance both in outpatient and inpatient care, urban and rural areas, one cannot but note the high level of workload of specialists, which was most evident during the pandemic of the new coronavirus infection (COVID-19).

The social status of a doctor, his working conditions and motivation largely determine the efficiency of Labor, the desire to work in the profession for many years [3–7]. This, in turn, affects the health status of citizens, the quality of their lives and, as a consequence, the social and economic well-being of society [8–10]. In this regard, it is extremely important to pay attention to the health and psychological comfort of the main participant in providing medical care to the population — the doctor, because the health of future generations depends on medical specialists to a great extent [11, 12].

At present, it remains extremely important to motivate, attract and, most importantly, retain specialists (primarily young specialists) in medical institutions both in inpatient, and in outpatient care.

Nowadays, under extremely high load on infectious disease specialists, it is important to determine peculiarities of a social and hygienic portrait of doctors of this specialty and to develop measures to improve their professional activity, which may be very relevant and timely.

AIM

The aim of the study was to determine a complex social and hygienic portrait of infectious disease doctors working in medical organizations of the Southern Federal District (SFD) and the North Caucasus Federal District (NCFD).

To achieve this goal, the following objectives were pursued: to study the main professional,

demographic, social, economic and other characteristics of this group of specialists, as well as to establish their peculiarities in individual subjects of the Southern Federal District and the North Caucasus Federal District; to identify the most typical features of the social and hygiene portrait of a modern infectious disease specialist working in these territories, taking into account gender characteristics.

MATERIALS AND METHODS

The research materials were the data of the social survey carried out in 2022 among 262 doctors working in the specialty "Infectious Diseases", representing regional medical organizations of the Southern Federal District (Astrakhan Region, Volgograd Region, Krasnodar Territory, Republic of Kalmykia, Rostov Region, Sevastopol city), as well as the North Caucasian Federal District (Karachay-Cherkess Republic, Stavropol Territory).

The subject of the research was the social and hygienic portrait of an infectious disease specialist.

An anonymous questionnaire survey was applied as a method of data collection on a voluntary basis. The questionnaire was preceded by an informed statement of an interviewer which described the aims of the research.

The questionnaire consisted of 53 questions (10 questions — 2 response options, 14 questions — 3 response options, 15 questions — 4 response options, 2 questions — 5 response options, 3 questions — 6 response options, 4 questions — 7 response options, 1 question — 9 response options, 2 questions — 10 response options), grouped into four thematic blocks: the first — passport, the second — a block reflecting demographic, social, economic and medical aspects of the interviewees. This publication presents the results of analyzed questions of the first two blocks (35 questions: 7 questions — 2 response options, 10 questions — 3 response options, 9 questions — 4 response options, 1 question — 5 response options, 3 questions — 6 response options, 3 questions — 7 response options, 1 question — 9 response options, 2 questions — 10 response options). These questions made it possible to identify social, demographic and professional-motivational characteristics among the surveyed infectious disease specialists, which formed their social and hygienic portrait. The questionnaire used mostly closed and semi-closed questions. Statistical analysis was performed using SPSS Statistics 26 software (IBM Corp., 2018), spreadsheet software MS Office Excel 2010. The comparison of proportions of categorical variables was performed using the χ^2 test, including the Yates correction in case of expected n <5 phenomena (for contiguity tables) and the z-criterion to assess equality of trait shares (for comparison of individual trait categories within contiguity tables).

RESULTS

The data obtained show that 74.9% of the surveyed infectious disease specialists were women, and only every fifth specialist was a male.

A study of the age composition shows that the highest proportion of specialists is represented in the 30–45 age group (40.9% among women and 40.7% among men). It is noteworthy that there are 4 women for every man in this group. The dominant role of this age group among infectious disease physicians indicates the presence of a certain reserve for staff stability in the work of the infectious disease service. Specialists under 30 years of age were the smallest group in terms of percentage ratio — only every tenth woman (9.8%) and every seventh man (14.8%). Speaking about the ratio, the highest level was recorded among specialists aged 46–59, with six women for every man.

Nevertheless, almost one fifth of all specialists (14.8% of men and 9.6% of women) belong to the age category 60 years and older, which may indicate a high probability of specialists' retirement due to age. No statistical differences were found in the shares of the trait in each age range ($p > 0.05$). The χ^2 test also demonstrates no significant differences between frequency ratios ($p=0.381$) (Fig. 1).

The above-described gender and age ratios remain stable across the regions. Thus, the Krasnodar Territory employed 51.7% of infectious disease specialists under 45 years of age, the Stavropol Territory — 55.0%, the Astrakhan Region — 53.6%, and the Karachay-Cherkess Republic — 52.6%.

At the same time, some regions showed marked fluctuations in this ratio in different age groups.

For example, young doctors under 30 years of age were absent in Sevastopol, Volgograd Region and the Republic of Kalmykia, while in Rostov

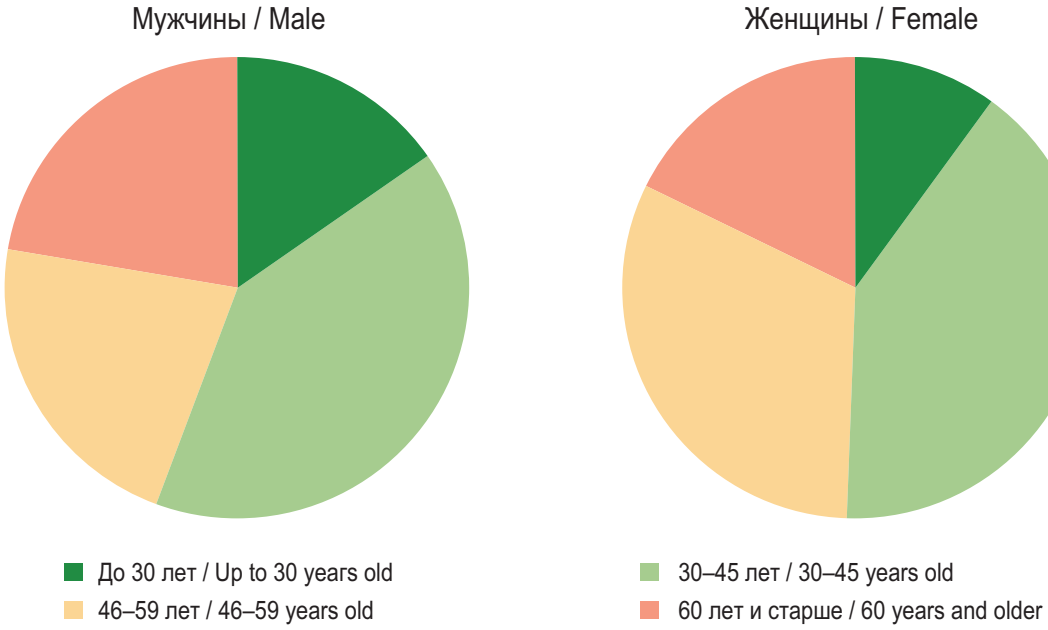

Fig. 1. Distribution of the surveyed infectious diseases doctors by gender in certain age groups, %

Рис. 1. Распределение опрошенных врачей-инфекционистов по полу в отдельных возрастных группах, %

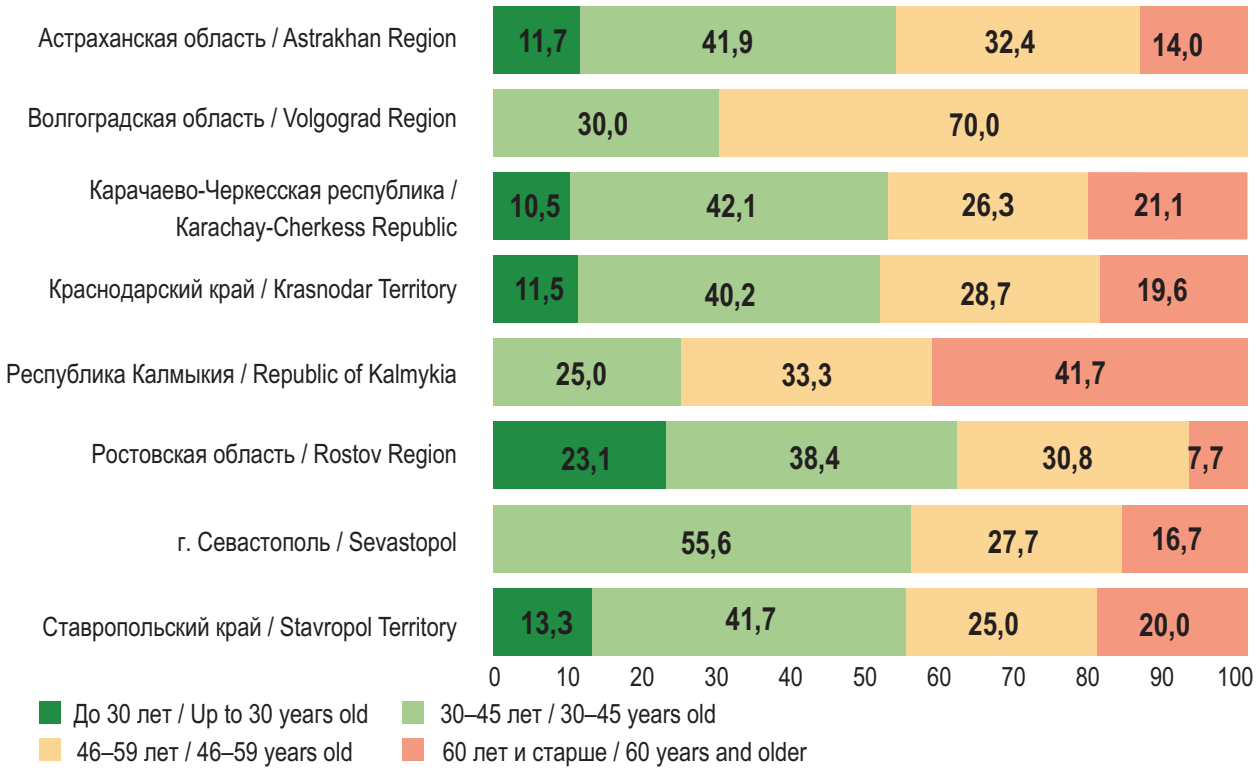

Fig. 2. The age structure of the surveyed infectious diseases doctors by region, %

Рис. 2. Возрастная структура опрошенных врачей-инфекционистов по регионам, %

Region they were largely represented by 23.1% of the total number of specialists in the region. Infectious disease specialists in the older age group (60+) were most numerous in the Republic of Kalmykia (41.7%), while they were absent in Volgograd Region (Fig. 2).

The vast majority of infectious disease specialists were graduates of the Faculty of Medicine

(57.6%), 39.7% of the Faculty of Pediatrics, and 2.7% of the Faculty of Sanitation and Hygiene (Faculty of Preventive Medicine).

The largest proportion of infectious disease specialists who graduated from higher education institutions with a degree in Medicine work in Krasnodar Territory (69.0%), and the smallest proportion work in Volgograd Region (20.0%). Specialists of the pediatric faculty are more common in the Volgograd Region (80.0%), and less common in the Karachay-Cherkess Republic (21.1%). Graduates of the sanitary-hygienic faculty (Preventive Medicine Faculty) meet in small numbers. These are physicians working in the Karachay-Cherkess Republic (15.8%) and Astrakhan Region (9.3%).

Analyzing the type of postgraduate education received by infectious diseases doctors, it should be noted that the vast majority of the specialists surveyed had completed an internship in infectious diseases (56.9%). They were more frequently from the Republic of Kalmykia (83.3%) and less frequently from Rostov Region (23.1%). 22.1% of respondents have a diploma on completion of residency training in the specialty "Infectious Diseases". The highest proportion of such doctors is among the representatives of Sevastopol (27.8%), and the lowest — among specialists from the Karachay-Cherkess Republic (5.3%). In the Volgograd Region there were no specialists who had completed residency training. Almost one-fifth (21.0%) of physicians had completed primary retraining in "Infectious diseases", the majority were infectious disease specialists from Volgograd (60.0%) and Rostov (53.8%) Region, and the minority were from Astrakhan Region (11.6%); there were no such specialists from the Republic of Kalmykia. The type of postgraduate education required to practice medicine in the specialty "Infectious diseases" is shown in Table 1.

3.8% of the surveyed infectious disease doctors have an academic degree. The degree of Doctor of Medical Sciences is held by specialists in Krasnodar Territory — 1.1%, Sevastopol — 5.6% and Rostov Region — 7.7%, which accounts to 1.1% of the total number of respondents in each region. 2.7% of specialists noted that they had a PhD in medical sciences. The highest share of infectious diseases doctors from the total number of respondents in the regions with a PhD degree was noted in the Rostov region — 7.7%. The academic title of professor is held by 0.8% of all respondents, the title of associate professor is held by 0.8%.

More than half of the specialists (51.1%) have a qualification category. Among them, 34.0% have the highest category, 11.5% have the first category, and 5.7% of the total number of respondents have the second category. They became infectious disease doctors after completing internship (52.9%), residency (25.3%) and primary retraining (21.8%). The majority of specialists with higher and first categories work in the Volgograd Region (100.0%) and Sevastopol (61.1%), and the least number of doctors is seen in the Rostov Region (30.8%).

Table 1

The number of infectious diseases doctors by type of postgraduate education, depending on the position held

Таблица 1

Количество врачей-инфекционистов по виду последипломного образования в зависимости от занимаемой должности

Регион / Region	Вид последипломного образования / Type of postgraduate education			
	интернатура,% / internship,%	ординатура,% / residency,%	первичная переподготовка,% / primary retraining,%	всего,% / total,%
Астраханская область / Astrakhan Region	62,8	25,6	11,6	100,0
Волгоградская область / Volgograd Region	40,0	0,0	60,0	100,0
Карачаево-Черкесская Республика / Karachay-Cherkess Republic	68,4	5,3	26,3	100,0
Краснодарский край / Krasnodar Territory	52,9	25,3	21,8	100,0
Республика Калмыкия / Republic of Kalmykia	83,3	16,7	0,0	100,0
Ростовская область / Rostov Region	23,1	23,1	53,8	100,0
г. Севастополь / Sevastopol	55,6	27,8	16,7	100,0
Ставропольский край / Stavropol Territory	60,0	23,3	16,7	100,0
Итого / Total	56,9	22,1	21,0	100,0

There is also a logical connection between the qualification category and age: the older the age, the higher the category.

The greatest number of specialists with the highest category work in infectious diseases hospitals (43.8%). The vast majority of specialists working in infectious diseases departments at central district hospitals, at city hospitals and special offices at outpatient clinics have no category at all — 75.6, 51.9, and 72.1%, respectively (Table 2).

The total medical experience of infectious diseases specialists who took part in the survey was distributed as follows. The majority of respondents have been working as a doctor for more than 30 years (23.3%), the minority — up to 5 years and 26–30 years (9.2% each). More than half of the respondents (56.9%) have up to 20 years of experience in medicine. In the Stavropol Territory (33.3%) and Rostov Region (46.2%), the largest proportion of respondents are specialists with up to 10 years of experience, and the smallest proportion are in the Republic of Kalmykia (8.3%). It should also be noted that the most experienced specialists took part in the survey in the Republic of Kalmykia: 66.7% of respondents had more than 30 years of medical experience (Table 3). No differences were found between men and women (χ^2=3.891, p=0.691).

Table 2

Availability of a qualification category depending on the organizational structure of the place of work,%

Таблица 2

Наличие квалификационной категории в зависимости от организационной структуры места работы,%

Квалификационная категория / Qualification category	Высшая / Higher	Первая / First	Вторая / Second	Отсутствует / Absent	Итого / Total
Инфекционная больница,% / Hospital of infectious disease,%	43,8	17,1	5,5	33,6	100,0
Инфекционное отделение в структуре городской больницы,% / Infectious diseases department in the structure of the city hospital,%	33,3	3,7	11,1	51,9	100,0
Инфекционное отделение в структуре ЦРБ,% / Infectious diseases department in the structure of the Central District Hospital,%	8,9	6,7	8,9	75,6	100,0
Специализированный кабинет при поликлинике,% / Specialized office at the clinic,%	25,6	2,3	–	72,1	100,0

Table 3

The structure of the surveyed infectious diseases doctors, depending on the available general medical experience, by gender,%

Таблица 3

Структура опрошенных врачей-инфекционистов в зависимости от имеющегося общего врачебного стажа работы, по полу,%

Регион / Region	Общий врачебный стаж работы / General medical work experience							
	до 5 лет / up to 5 years	5–10 лет / 5–10 years	11–15 лет / 11–15 years	16–20 лет / 16–20 years	21–25 лет / 21–25 years	26–30 лет / 26–30 years	более 30 лет / more than 30 years	Всего,% / Total,%
Астраханская область / Astrakhan Region	11,6	18,6	16,3	11,6	11,6	14,0	16,3	100,0
Волгоградская область / Volgograd Region	0,0	0,0	70,0	10,0	0,0	20,0	0,0	100,0
Карачаево-Черкесская Республика / Karachay-Cherkess Republic	5,3	15,8	26,3	10,5	15,8	15,3	21,1	100,0
Краснодарский край / Krasnodar Territory	10,3	10,3	16,1	19,5	13,8	5,7	24,1	100,0
Республика Калмыкия / Republic of Kalmykia	0,0	8,3	8,3	8,3	0,0	8,3	66,7	100,0
Ростовская область / Rostov Region	23,1	23,1	7,7	30,8	0,0	7,7	7,7	100,0
г. Севастополь / Sevastopol	0,0	16,7	16,7	22,2	22,2	5,6	16,7	100,0
Ставропольский край / Stavropol Territory	10,0	23,3	8,3	11,7	6,7	11,7	28,3	100,0
Итого,% / Total,%	9,2	15,6	16,4	15,6	10,7	9,2	23,3	100,0

Describing the marital status, it is worth noting that the majority of interviewed doctors, regardless of the region (χ^2=25.902, p=0.210), are in a registered marriage (59.5%), the smallest number — 46.2% in Rostov Region, the largest — 65.1% in Volgograd region. Taking into account regional peculiarities (statistical significance at the level of p=0.047), the majority of surveyed infectious disease doctors (81.3%) are parents and bring up two children (49.5%). Large families (three children and more) are more common in the families of doctors from the Karachay-Cherkess Republic (26.3%).

The vast majority of infectious diseases doctors, regardless of region (χ^2=7.763, p=0.354), have their own housing (88.2%). However, living conditions vary significantly by region (χ^2=24.048, p=0.045). Thus, in almost all regions, infectious diseases doctors more often live in flats (59.2%). The exception is the Karachay-Cherkess Republic, where the majority of specialists live in their own homes (63.3%). This may be explained by the specifics of urbanization in the Karachay-Cherkess Republic, where the private sector predominates among buildings. Almost half of infectious diseases doctors (51.9%) are fully satisfied with their living conditions.

Speaking about the state of health of the surveyed infectious disease doctors, the presence of chronic diseases was noted by specialists in almost half of cases (48.1%) with regional variation. This fact was most often mentioned by doctors from the Republic of Kalmykia (75.0%), Krasnodar Krai (55.5%) and Sevastopol (50.0%). In other regions, the number of doctors noting the absence of chronic diseases prevails. The highest share of answers indicating absence of chronic diseases was found in the Volgograd Region (70.0%) and the Rostov Region (61.5%). Comparison of men and women by frequency of chronic diseases showed no statistically significant differences (χ^2=0.036, p=0.850).

Diseases of the circulatory system (30.5%) are in the first place in the structure of the diseases indicated by the respondents. The second place is occupied by diseases of digestive organs and diseases of endocrine system, nutritional disorders and metabolic disorders (13.3%). The third place is occupied by respiratory diseases (11.7%). The following chronic diseases were also indicated by infectious diseases specialists: diseases of the musculoskeletal system and connective tissue — 9.4%, diseases of the eye and its apparatus — 3.9%, diseases of the nervous system — 2.3%, neoplasms — 2.3%, diseases of the skin and subcutaneous tissue — 1.6%, injuries, poisonings and some other consequences of external causes — 1.6%, diseases of the blood, hematopoietic organs and certain disorders involving the immune mechanism — 0.8% of the total number of the indicated chronic diseases.

In contrast, there were differences in the frequency of chronic diseases among individual age groups (χ^2=17.348, p=0.001). Thus, 17.9% of young doctors (up to 30 years of age) indicated the presence of chronic diseases, 46.5% — in the group of 30–45 years, 51.9% — 46–59 years, and 66.7% — 46–59 years, i.e. the older the specialists, the higher the percentage of chronic diseases.

When assessing their working conditions, the majority of respondents indicated the presence of conditions which negatively affected their health (86.6%). This answer was given more often by infectious disease specialists from the Volgograd Region (100.0%), Stavropol Krai (93.3%) and Krasnodar Territory (92.0%). Doctors in each region said that working conditions affected their health (53.4%). The analysis shows that the hypothesis of such a connection is confirmed: thus, the frequency of answers indicating satisfaction with the quality of life is significantly higher (p <0.001) among those specialists who believe that their work does not affect their health.

The regions in which specialists least often noted the presence of unfavorable working conditions were the Karachay-Cherkess Republic (52.6%) and the Rostov Region (46.2%).

Respondents most often named stress and psychological and emotional strain, physical overload, night duty, overwork, fatigue, irregular working hours, contact with infections and disinfectants, “sedentary” work, eye fatigue, insufficient sleep and insomnia, increased blood pressure and arrhythmia as negative health changes associated with work.

The interviewed infectious disease specialists also answered to the question concerning free leisure time. Specialists sometimes visit cultural places and events out of working hours. 8.8% of respondents regularly do so, more often these are doctors in Sevastopol (16.7%), and less often — specialists in Stavropol Territory (5.0%). The answer “whenever possible and desirable” was given by the majority of doctors (61.5%), more often by specialists from the Volgograd Region (90.0%), and less often — by doctors from the Rostov Region (38.5%). However, more than a third (39.8% of the

total number of respondents) do not have such an opportunity at all. The main reason is the lack of free time due to high workload (20.6%) — this was the answer of the majority of specialists from the Rostov Region. "Due to limited income" (7.3%) — this was the answer given more often by doctors from the Astrakhan Region. 1.9% of the total number of respondents do not attend cultural and entertainment events due to lack of desire, mainly these are specialists from the Karachay-Cherkess Republic.

When asked about the psychological-emotional state, the respondents were almost equally divided. The majority of infectious disease doctors (51.5%) are in a state of psychological-emotional stress quite often and very often while working. It became especially acute in the conditions of the new coronavirus infection pandemic (COVID-19). This fact was often noted by specialists from Rostov Region (69.2%). Constantly high workload is noted by one third of the surveyed infectious disease doctors, mainly from Rostov Region (38.5%). This ratio remains the same in most regions. Doctors with 15 years of experience noted they were in stress during the working day much more often.

48.5% of the surveyed experience these negative emotions either never or rarely, in the Volgograd Region they do not note this fact at all (100.0%). It was least noted in the Rostov Region (30.8%).

It should be noted that the presence of professional burnout on a scale from 1 (the lowest) to 10 (the highest) in infectious disease doctors is estimated at 6 points. More than a third (36.6%) of specialists will not change their place of work even if the salary would be higher. The results of statistical analysis show a clear relationship between the level of fatigue, professional burnout and the desire to change the place of work ($p < 0.001$). Thus, the average level of professional burnout in those doctors who definitely do not want to change their place of work is significantly lower.

Despite this, 89.3% of infectious disease doctors answered "yes" to the question "do you like your profession and labor activity".

The leading causes of psychological discomfort during work include unjustified complaints from patients, a large amount of "paper" work, frequent documentation checks and stress due to lack of time and high workload. In general, respondents assessed their future prospects as "moderately optimistic" (55.7%), most often this answer was given by specialists from the Karachay-Cherkess Republic (63.2%), and least often by specialists from the Rostov Region (46.2%). Despite this, 75.2% of respondents are "absolutely confident" in themselves.

The survey results showed that the most unattractive factor of professional activity, which does not depend on gender and age, is the low level of salary. This fact was noted by specialists in all regions. For young specialists the actual problems are the nature of labor and relations in the team, which is logically explained by the need to adapt to the conditions of new professional activity. The older generation of infectious disease doctors aged 60 years and older is more often concerned about the low prestige of the profession, as well as the tendency to discredit the medical profession as a whole (Table 4).

The study resulted in the formation of the most typical social and hygienic portraits of infectious disease doctors.

A portrait of an average male infectious disease doctor working in the regions of southern Russia: a specialist aged 30–45 years, who graduated from a medical faculty, has no degree or academic title, and no qualification category. General medical experience is in the range of 11–15 years, and up to 10 years in the specialty "Infectious Diseases". Document giving him the right to conduct medical activity as an infectious diseases doctor is a diploma on completion of internship in the specialty "Infectious Diseases", and the specialist works in the infectious diseases hospital as a doctor. He is married, has two children, owns an apartment and is practically satisfied with his living conditions.

According to a subjective assessment, a specialist faces a high professional load and constant stress due to peculiarities of an infectious diseases department. In addition, he notes the presence of chronic diseases (more often these are diseases of the circulatory system), hypodynamic and harmful working conditions that have a negative impact on his living conditions. In general, the doctor is satisfied with the quality of his life. In general, the doctor is satisfied with the quality of his life. He occasionally attends cultural events in his free time and whenever he can. The infectious disease doctor is absolutely confident in himself as a person and is optimistic about his future prospects.

The man identifies a number of leading unattractive factors in his professional activity, such as low salary and the distant location of his workplace in relation to his home. The specialist often experiences a state of psychological and emotional stress, which, in turn, leads to the formation

Table 4

Unattractive factors in the work of infectious diseases doctors, depending on gender and age (an open questioning with several possible answers)

Таблица 4

Непривлекательные факторы в процессе работы врачей-инфекционистов в зависимости от пола и возраста (открытый вопрос, предполагающий несколько вариантов ответа)

Список факторов / List of factors	Пол / Sex		Возраст, лет / Age, years			
	женский / female n=208,%	мужской / male n=54,%	до 29 / to 29 n=28,%	30–45 n=107,%	46–59 n=79,%	60 лет и старше / 60 years and older n=48,%
Уровень заработной платы / Wage level	70,9	63,0	59,3	70,2	70,8	70,2
Количество пациентов / Number of patients	16,8	14,8	14,8	16,3	18,1	14,9
Характер труда / Nature of work	7,1	11,1	22,2*	3,8	6,9	10,6
Отношения в коллективе / Relationships in the team	9,2	11,1	22,2*	11,5	5,6	4,3
Отдаленность расположения места работы к дому / Location of workplace to home	14,3	22,2	18,5	16,3	15,3	14,9
Наличие постоянного стресса / Having constant stress	40,3	31,5	25,9	40,4	48,6	25,5
Отсутствие возможности повышать квалификацию / Lack of opportunity to improve skills	8,7	9,3	7,4	11,5	11,1	0,0
Низкий престиж профессии / Low prestige of the profession	23,5	18,5	14,8	16,3	25,0	36,2*
Другое / Other	6,1	5,6	3,7	7,7	6,9	2,1

* Статистически значимые различия на уровне p <0,05.
* Statistically significant differences at the level of p <0.05.

of professional burnout. Male professionals identify a number of leading unattractive factors in their professional activity, such as low wages and distant location of the place of work. A specialist often experiences a state of psychological and emotional stress, which, in turn, leads to the formation of professional burnout.

During the pandemic of the new coronavirus infection COVID-19, the doctor experienced a significant increase in professional workload. In his opinion, unfair claims from patients and lack of time in the process of Labor activity due to the high workload of the specialist played a leading role in the development of psychological discomfort in the workplace. A male infectious disease doctor would like to change his place of work due to low salary. Despite all the difficulties, the specialist likes his profession and Labor activity.

Portrait of an average female infectious disease doctor working in the regions of southern Russia: a woman aged 30–45 who graduated from a medical university with a degree in Medicine and then completed an internship in infectious diseases. The doctor does not have a degree, academic title or qualification category. General medical experience, as well as in the specialty "Infectious Diseases" amounts to 11–15 years. The specialist works in an infectious diseases hospital as a doctor. She is married and has two children. The woman owns a flat and is fully satisfied with the living conditions. When interviewing infectious disease doctors, no reliable differences were found between the subjective assessment of the presence or absence of chronic diseases. The specialist has harmful Labor conditions at her workplace, which, in her opinion, may negatively affect her health. In general, she is satisfied with the quality of her life. The doctor does not always have the opportunity to attend cultural institutions and events because of the lack of free time due to the high workload. Assessing the prospects of her future, the doctor defines them as moderately optimistic. Nevertheless, she is self-confident.

The specialist often feels a state of psychological and emotional stress during her professional activity. Along with this, she also notes the presence of professional burnout. In the doctor's opinion, unfair claims from patients and stress from lack of time due to increased workload play a leading role in the formation of this state.

In the process of medical activity, the doctor notes a number of major unattractive factors, namely: the presence of constant stress, low salary level, and insufficient prestige of the medical profession in this specialty. During the pandemic of a new coronavirus infection COVID-19, the doctor noted a significantly increased work load. The woman would not want to change her place of work if the salary was higher. The specialist enjoys her profession and her working life despite all the difficulties she has to face at work.

CONCLUSION

The research has revealed professional and personal characteristics among the interviewed infectious disease doctors in terms of gender. Men are more likely to suffer from chronic diseases than women. Female doctors are more exposed to stress during work than male doctors. The presence of general fatigue and professional burnout was more often noted by female specialists.

According to the survey of infectious disease doctors, a number of problems related to the organization of the work process encountered by practitioners were identified. These include a high level of stress among specialists in the process of Labor activity, heavy workload due to the lack of a proper number of specialists according to the staff schedule, insufficient salary level and low prestige of the profession in general.

The survey allowed us to give a multifaceted professional and personal characteristic of an infectious disease doctor, and, based on its results, to form a social and hygienic portrait of a modern infectious disease specialist working in the Southern Federal District and the North Caucasian Federal District.

Taking into account the above-mentioned problems based on the results of the survey, there is a need for further development of social support measures for persons working in this specialty. It is necessary to improve the planning of medical personnel training, as well as measures to attract and retain those who already work in the profession, since the surveyed doctors are key persons in providing medical care to the adult population in case of infectious diseases.

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. The authors received written consent from the respondents to publish the data.

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 анкетируемых на публикацию данных.

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UDC 616.21-082-053.2+616.322-002.2+614.812+001.891+614.2
DOI: 10.56871/MHCO.2024.48.98.004

THE INFLUENCE OF MEDICAL AND ORGANIZATIONAL FACTORS ON THE RISK OF REDUCING THE AVAILABILITY OF OTORHINOLARYNGOLOGICAL CARE FOR CHILDREN AND ADOLESCENTS

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For citation: Oleinik AV, Mingazova EN, Kim AV, Gureva NA, Smirnova VI. The influence of medical and organizational factors on the risk of reducing the availability of otorhinolaryngological care for children and adolescents. Medicine and Health Care Organization. 2024;9(2):37–43. DOI: https://doi.org/10.56871/MHCO.2024.48.98.004

Received: 21.05.2024 ***Revised: 14.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. ***Introduction.*** The article presents the results of a study conducted to develop new technologies for managing medical organizations to prevent unwanted risks of reducing the availability of otorhinolaryngological care for children and adolescents. Based on the fact that expert assessments and a sociological survey among patients (their representatives) make it possible to characterize the frequency, nature, direction and structure of the influence of medical, organizational and consumer factors on the quality and accessibility of medical care, we applied this approach to predict risk factors for reducing availability of this type of assistance. ***Purpose*** — to determine the prognostic significance of the influence of medical and organizational factors on the risk of decreased availability of otorhinolaryngological care for children and adolescents. ***Materials and methods:*** analytical, sociological, statistical methods, as well as the method of expert assessments were used. ***Results.*** Based on expert assessments, an analysis of the state of preparedness of the healthcare system to ensure the availability of otolaryngological care for children and adolescents was conducted, which, in turn, became the basis for an analysis of 10 medical and organizational factors. ***Conclusions.*** It was revealed that in the structure of the conditionality of the availability of otolaryngological care for children and adolescents, all medical and organizational factors are controllable. The five most significant of them included: low staffing of ENT doctors, a high level of conflict among staff, the lack of implementation of "lean technologies" and the "New Medical Organization" model in medical organizations, low communicative competence of personnel, low level of provision of equipment to perform the volumes of assistance.

KEYWORDS: otorhinolaryngological care, accessibility, children and adolescents, medical and organizational factors, prognosis

ВЛИЯНИЕ МЕДИКО-ОРГАНИЗАЦИОННЫХ ФАКТОРОВ НА РИСК СНИЖЕНИЯ ДОСТУПНОСТИ ОТОРИНОЛАРИНГОЛОГИЧЕСКОЙ ПОМОЩИ ДЕТЯМ И ПОДРОСТКАМ

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Для цитирования: Олейник А.В., Мингазова Э.Н., Ким А.В., Гурьева Н.А., Смирнова В.И. Влияние медико-организационных факторов на риск снижения доступности оториноларингологической помощи детям и подросткам // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 37–43. DOI: https://doi.org/10.56871/MHCO.2024.48.98.004

Поступила: 21.05.2024 ***Одобрена: 14.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. ***Введение.*** В статье представлены результаты исследования, проведенного в целях разработки новых технологий управления медицинскими организациями по предупреждению нежелательных рисков снижения доступности оториноларингологической помощи детям и подросткам. Исходя из того, что экспертные оценки и социологический опрос среди пациентов (их представителей) позволяют получить характеристику частоты, характера, направленности и структуры влияния медико-организационных и потребительских факторов на качество и доступность медицинской помощи, мы применили данный подход для прогнозирования риск-факторов снижения доступности данного вида помощи. ***Цель исследования*** — определить прогностическую значимость влияния медико-организационных факторов на риск снижения доступности оториноларингологической помощи детям и подросткам. ***Материалы и методы исследования.*** Применялись аналитический, социологический, статистический методы, а также метод экспертных оценок. ***Результаты.*** На основе экспертных оценок проведен анализ состояния подготовленности здравоохранения к обеспечению доступности оториноларингологической помощи детям и подросткам, что, в свою очередь, стало основанием для анализа по 10 медико-организационным факторам. ***Выводы.*** Выявлено, что в структуре обусловленности доступности оториноларингологической помощи детям и подросткам все медико-организационные факторы являются управляемыми. В пятерку наиболее значимых из их числа вошли: низкая штатная укомплектованность ЛОР-врачами, высокий уровень конфликтности персонала, отсутствие внедрения в медицинских организациях «бережливых технологий» и модели «Новой медицинской организации», низкая коммуникативная компетентность персонала, низкий уровень обеспеченности оборудованием для выполнения объемов помощи.

КЛЮЧЕВЫЕ СЛОВА: оториноларингологическая помощь, доступность, дети и подростки, медико-организационные факторы, прогноз

INTRODUCTION

Modern management in the health care system is focused on preventing the risks of adverse events [1–3]. That is why we applied a risk-oriented approach to assessing and improving the management of accessibility of otorhinolaryngological care for children and adolescents.

Expert assessments and sociological survey among patients (their representatives) allow us to obtain a characteristic of the frequency, nature, direction and structure of the influence of medical-organizational and consumer factors on the quality and accessibility of medical care [4–6]. In our study, this approach was the theoretical basis for the formation of the technology for predicting the risk factors of reducing the availability of otorhinolaryngological care for children and adolescents.

AIM

To determine the prognostic significance of the influence of medical and organizational factors on the risk of reducing the availability of otorhinolaryngological care for children and adolescents.

MATERIALS AND METHODS

Analytical, sociological, statistical methods, as well as the method of expert assessments were applied. The study was conducted in 2022. We analyzed 1,200 card extracts of information on the frequency and reasons for the decrease in the availability of medical care for children and adolescents in the field of otorhinolaryngology.

RESULTS

On the basis of expert assessments, an analysis of the state of preparedness of health care to ensure accessibility of otorhinolaryngological care for children and adolescents was carried out, which, in turn, became the basis for an analysis of 10 medical and organizational factors.

1. Analysis of the factor “staffing levels of ENT doctors” showed that the frequency of defects in access to care in the “low staffing level” of medical organizations (MOs) as a whole was 17.0 per 100 cases (including 21.5 in government MOs and 12.4 in private MOs per 100 cases) ($p < 0.05$), and 1.5, 2.0 and 1.0 per 100 cases ($p > 0.05$), respectively, in the “90–100% staffing level”. The most pronounced are deviations of accessibility in the gradation of the factor “low level of staffing”, which creates conditions for queues and increases the waiting time for a specialist’s appointment.

2. Analysis of the factor ‘staff training in “lean technologies” and the “New MO” model’ has shown that the frequency of defects in accessibility of care according to the gradation “low level of staff training” totaled 17.5 per 100 cases (including in public MOs 20.5 and private MOs 14.5 per 100 cases) ($p < 0.05$). For the gradation “the part of the staff trained” it was 4.3, 3.5 and 5.0 per 100 cases, respectively ($p > 0.05$). For the gradation “all staff trained” it was 3.3, 4.4 and 2.0 per 100 cases, respectively ($p > 0.05$). The most pronounced accessibility deviations were in the gradation of the factor “low level of staff training”, which is determined by the lack of necessary competences and the lack of effective communication with patients.

3. The analysis of the factor ‘digitalization of workplaces in MOs’ showed that the frequency of accessibility defects in the gradation “low level of digitalization of workplaces (75% or less of the number of workplaces)” was 13.6 per 100 cases (including in public MOs 16.5 and private MOs 10.6 per 100 cases) ($p < 0.05$), and in the gradation “high level of digitalization of 90–100% of workplaces” it was 2.8, 3.0 and 2.5 per 100 cases, respectively. The most pronounced deviations of accessibility are in the gradation of the factor “low level of digitalization of workplaces”, which creates barriers to the use of remote technologies, increases the share of “paper” work and increases the share of time losses.

4. The analysis for the factor “digital competence of staff” showed that the defect rate for the gradation “digital competence of staff is determined in 75% or less of the total staff” was 15.5 per 100 cases overall (including 17.5 in public MOs and 13.5 per 100 cases in private MOs) ($p < 0.05$), and 3.7, 5.1 and 2.2 per 100 cases ($p > 0.05$) for the gradation “competence among 90–100% of staff” respectively ($p > 0.05$).

5. The analysis of the factor “communicative competence of the staff” showed that the frequency of defects in the accessibility of care

according to the gradation "low level of competence is determined in 75% or less of the total number of employees" in general was 16.8 per 100 cases (including in public MOs 19.8 and private MOs 13.8 per 100 cases) ($p < 0.05$), according to the gradation 'competence of 90–100% of the staff' respectively 2.5, 3.0 and 2.0 per 100 cases. The most pronounced deviations of availability in the gradation of the factor "low level of communicative competence", which creates barriers to interpersonal communication and conditions for the conflict situations formation.

6. The analysis of the factor "staff's conflictivity" has shown that the frequency of defects in the accessibility of care according to the gradation "high level of conflictivity (refusal of cooperation tactics)" was 19.5 per 100 cases (including in public MOs 22.5 and private MOs 16.5 per 100 cases) ($p < 0.05$), according to the gradation "low level of conflictivity (the use of cooperation tactics)" 1.8, 7.4 and 3.5 per 100 cases respectively ($p < 0.05$). The most pronounced deviations of accessibility are in the gradation of the factor "high level of conflictivity", which creates tension in interpersonal communications, forms a negative attitude to the MO and health care, and forms psychological barriers to the availability of medical care.

7. The analysis of the factor "staff labor satisfaction" showed that the frequency of defects in the availability of assistance according to the gradation "low level of labor satisfaction" was 17.9 per 100 cases (including 21.3 in public MOs and 14.5 in private MOs per 100 cases) ($p < 0.05$), and according to the gradation "high level of labor satisfaction" 7.1, 8.6 and 5.5 per 100 cases, respectively ($p < 0.05$). The most pronounced deviations of accessibility in the gradation of the factor "low level of satisfaction", which creates tension in the labor collective, reduces labor motivation and forms psychological barriers to the availability of assistance.

8. Analysis of the factor "organizational culture of the MOs" showed that the frequency of defects in accessibility of care according to the gradation "organizational culture focused on solving immediate tasks" was 13.0 per 100 cases (including 13.5 in public MOs and 12.5 per 100 cases in private MOs) ($p < 0.05$), and according to the gradation "organizational culture focused on achieving indicators" 7.5, 12.8 and 5.5 per 100 cases, respectively ($p < 0.05$). For the gradation "patient-oriented organizational culture" 2.9, 3.6 and 2.2 per 100 cases, respectively ($p > 0.05$). The most significant deviations of availability in the gradation of the factor "organizational culture focused on solving immediate tasks", which creates barriers to the implementation of professional orientation towards attentiveness to the needs and requests of patients, taking into account their individual characteristics, and the lack of a personalized approach to solving emerging problems.

9. The analysis of the factor "availability of equipment to fulfil the scope of care" has shown that the frequency of defects in the availability of care according to the gradation "availability of equipment at 75% and below the need" in general was 15.0 per 100 cases (including 19.5 in public MOs and 10.5 in private MOs per 100 cases) ($p < 0.05$), with availability of 76–89% respectively 7.2, 7.5 and 7.8 per 100 cases; with availability of 90–100% respectively 2.3, 2.9 and 1.7 per 100 cases. The most significant deviations of accessibility in the gradation of the factor "availability of equipment at 75% and below the need", which creates barriers to the implementation of professional competence of medical staff, reduces the possibility of implementing new diagnostic and treatment technologies and realizing the needs of patients in them.

10. The analysis of the factor "Modern technologies of diagnostics and treatment of ENT diseases" showed that the frequency of defects in the availability of care according to the gradation "implementation of modern technologies of diagnostics at the level of 75% and below" was 14.0 per 100 cases (including 16.5 in public and 11.5 in private MIs per 100 cases) ($p < 0.05$), and according to the gradation "implementation of modern technologies of diagnostics at the level of 76–89%" 8.5, 10.5 and 6.5 per 100 cases, respectively ($p > 0.05$). For the gradation "implementation of modern diagnostic technologies to the extent of 90–100%" 2.5, 3.0 and 2.0 per 100 cases, respectively. The most significant deviations of accessibility in the gradation of the factor "implementation of modern diagnostic technologies at the level of 75% and below", which creates barriers to technological accessibility, forms the basis for untimeliness of care, errors in diagnosis, leading to a decrease in patient satisfaction with medical care.

Determination of the frequency of medical and organizational factors depending on the level

Table 1

Prognostic significance of medical and organizational factors in ensuring accessibility of otorhinolaryngological care for children and adolescents

Таблица 1

Прогностическая значимость медико-организационных факторов в обеспечении доступности оториноларингологической помощи детям и подросткам

Факторные характеристики / Factor characteristics	Уровень доступности / Availability level	Частота фактора (P ± m%) / Factor frequency (P ± m%)	ДИ (%)/ CI (%)	ОР / RR	НИП / NII	ПК / PC
Подготовленность кадров по «бережливым технологиям» и модели «Новой МО» / Personnel training in “lean technologies” and the “New MO” model	Имеется / Present	17,5 ± 0,9	15,1–19,3	5,30	0,70	3,71
	Отсутствует / Absent	3,3 ± 0,2	2,9–3,7		0,13	0,69
Укомплектованность штатов ЛОР-врачами / Staffing level of ENT doctors	Имеется / Present	17,0 ± 0,8	15,4–18,6	11,30	0,68	7,68
	Отсутствует / Absent	1,5 ± 0,3	1,2–2,1		0,60	6,78
Цифровая компетентность персонала / Digital competence of the staff	Имеется / Present	15,5 ± 0,8	13,9–17,1	4,19	0,62	2,59
	Отсутствует / Absent	3,7 ± 0,3	3,1–4,3		0,15	0,62
Коммуникативная компетентность персонала / Communicative competence of the staff	Имеется / Present	16,8 ± 0,7	15,4–16,6	6,72	0,67	4,50
	Отсутствует / Absent	2,5 ± 0,2	2,1–2,9		0,10	0,67
Конфликтность персонала / Staff conflict	Имеется / Present	19,5 ± 0,7	17,1–20,9	10,83	0,79	8,55
	Отсутствует / Absent	1,8 ± 0,3	1,5–2,4		0,07	0,76
Удовлетворенность трудом персонала / Staff job satisfaction	Имеется / Present	17,9 ± 0,8	16,1–19,5	2,52	0,72	1,81
	Отсутствует / Absent	7,1 ± 0,5	6,1–8,2		0,28	0,70
Организационная культура МО / MO organizational culture	Имеется / Present	13,0 ± 0,7	11,6–14,4	4,48	0,52	2,33
	Отсутствует / Absent	2,9 ± 0,2	2,5–3,3		0,12	0,53
Цифровизация рабочих мест / Digitalization of workplaces	Имеется / Present	13,6 ± 0,8	12,1–15,2	4,86	0,54	2,62
	Отсутствует / Absent	2,8 ± 0,2	2,4–3,2		0,11	0,53
Обеспеченность оборудованием для выполнения объемов помощи / Provision of equipment to carry out volumes of assistance	Имеется / Present	15,0 ± 0,9	13,2–16,8	6,52	0,60	3,91
	Отсутствует / Absent	2,3 ± 0,1	2,2–2,4		0,09	0,59
Современные технологии диагностики и лечения ЛОР-заболеваний / Modern technologies for diagnosing and treating ENT diseases	Имеется / Present	14,0 ± 0,7	13,6–15,4	5,60	0,56	3,13
	Отсутствует / Absent	2,5 ± 0,2	2,1–2,9		0,10	0,56

Note: CI — confidence interval; RR — relative risk; NII — normalized intensive indicators; PC — predictive coefficients.

Примечание: ДИ — доверительный интервал; НИП — нормированные интенсивные показатели; ОР — относительный риск; ПК — прогностические коэффициенты.

of accessibility of care made it possible to calculate their prognostic significance in relation to the risk of its reduction (Table 1).

Table 2 presents the medical and organizational risk factors for reducing the availability of this care. The top five most significant of them were: “staffing of ENT doctors” (CI=11.30), “staff conflict” (CI=10.83), “communicative competence of the staff” (CI=6.72), “equipment availability to fulfil the scope of care” (CI=6.52).

CONCLUSION

Thus, the analysis revealed that all medical and organizational factors are controllable in the structure of factor conditioning of access to otorhinolaryngological care for children and adolescents. The top five most significant among them are: low staffing levels of ENT doctors, high level of staff conflict, lack of implementation of “lean technologies” and the “New MO” model, low communicative competence of staff,

Table 2

Ranking of medical and organizational risk factors for reducing the availability of otorhinolaryngological care for children and adolescents

Таблица 2

Ранжирование медико-организационных факторов риска снижения доступности оториноларингологической помощи детям и подросткам

Факторные характеристики / Factor characteristics	Весовой индекс / Weight Index	Ранг значимости / Significance rank
Укомплектованность штатов ЛОР-врачами / Staffing level of ENT doctors	11,30	1
Конфликтность персонала / Staff conflict	10,83	2
Коммуникативная компетентность персонала / Communicative competence of the staff	6,72	3
Обеспеченность оборудованием для выполнения объемов помощи / Provision of equipment to carry out volumes of assistance	6,52	4
Современные технологии диагностики и лечения ЛОР-заболеваний / Modern technologies for diagnosing and treating ENT diseases	5,60	5
Подготовленность кадров по «бережливым технологиям» и модели «Новой МО» / Personnel training in “lean technologies” and the “New MO” model	5,30	6
Цифровизация рабочих мест / Digitalization of workplaces	4,86	7
Организационная культура МО / MO Organizational Culture	4,48	8
Цифровая компетентность персонала / Digital competence of the staff	4,19	9
Удовлетворенность трудом персонала / Staff job satisfaction	2,52	10

low level of equipment availability to fulfil the volume of care.

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.

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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UDC 614.2
DOI: 10.56871/MHCO.2024.76.49.005

PREVENTIVE HOSPITALIZATION OF PATIENTS OVER 65 YEARS OLD WITH COVID-19 AS A WAY TO IMPROVE THE QUALITY OF MEDICAL CARE

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For citation: Karailanov MG, Moiseeva KE, Prokin IG, Bakanev OYu, Panfilov MS, Uzhokh-Bazhnokov OA, Slyusareva VV. Preventive hospitalization of patients over 65 years old with COVID-19 as a way to improve the quality of medical care. Medicine and Health Care Organization. 2024;9(2):44–51. DOI: https://doi.org/10.56871/MHCO.2024.76.49.005

Received: 11.04.2024 ***Revised: 15.05.2024*** ***Accepted: 15.07.2024***

ABSTRACT. From the time of the emergence and spread of the new coronavirus infection worldwide, medical personnel has repeatedly revised approaches to treating patients of different age groups. During the COVID-19 pandemic, special attention was paid to patients over 65 years of age, in concern with the decrease of physiological reserves, general resistance and stability of the body, and the presence of a number of chronic diseases. This category of patients, as a rule, suffers from cardiovascular, endocrinological, rheumatic diseases, chronic lung diseases and malignant neoplasms. The fundamental factor is the atypical manifestation of COVID-19 disease symptoms in patients over 65 years of age associated with progressive and rapid development of severe complications against the background of existing chronic diseases, including death. Adverse events such as complications and death from COVID-19 are a serious threat for people over 65 years of age. The purpose of the study is to evaluate the effectiveness of preventive hospitalization of patients over 65 years of age with COVID-19 in the city of St. Petersburg in 2021. In order to reduce the risk of complications in patients of the older age group during the COVID-19 pandemic, mandatory preventive hospitalization has been justified, aimed at an early initiation of treatment, round-the-clock monitoring and timely medical intervention. In order to assess the effectiveness of the measures taken during the pandemic, the article analyzed data of preventive hospitalization for 2021, organized in one of the largest districts of the city of St. Petersburg, with up to half a million residents. The results of the study suggest that timely preventive hospitalization has a positive effect on reducing mortality among people over 65 years of age and can be considered as a way to improve the quality and safety of medical care.

KEYWORDS: COVID-19, elderly and senile age, persons over 65 years of age, incidence of COVID-19, mortality from COVID-19, preventive hospitalization

ПРЕВЕНТИВНАЯ ГОСПИТАЛИЗАЦИЯ ПАЦИЕНТОВ СТАРШЕ 65 ЛЕТ С COVID-19 КАК СПОСОБ ПОВЫШЕНИЯ КАЧЕСТВА МЕДИЦИНСКОЙ ПОМОЩИ

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Для цитирования: Карайланов М.Г., Моисеева К.Е., Прокин И.Г., Баканев О.Ю., Панфилов М.С., Ужох-Бажноков О.А., Слюсарева В.В. Превентивная госпитализация пациентов старше 65 лет с COVID-19 как способ повышения качества медицинской помощи // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 44–51. DOI: https://doi.org/10.56871/MHCO.2024.76.49.005

Поступила: 11.04.2024 ***Одобрена: 15.05.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. С момента появления в мире новой коронавирусной инфекции медицинский персонал неоднократно пересмотрел подходы к лечению пациентов разных возрастных групп. Особое внимание в период пандемии COVID-19 было уделено пациентам старше 65 лет, учитывая у них снижение физиологических резервов, общей сопротивляемости и устойчивости организма, наличие ряда хронических заболеваний. Указанная категория пациентов, как правило, страдает сердечно-сосудистыми, эндокринологическими, ревматическими заболеваниями, хроническими заболеваниями легких и злокачественными новообразованиями. Основополагающим фактором является атипичная картина заболевания COVID-19 у пациентов старше 65 лет с прогрессивным и быстрым развитием тяжелых осложнений на фоне имеющихся хронических заболеваний, вплоть до летального исхода. Такие нежелательные события, как осложнения и смерть от COVID-19, являются серьезной угрозой для лиц старше 65 лет. Целью исследования является оценка эффективности превентивной госпитализации пациентов старше 65 лет с COVID-19 в городе Санкт-Петербург за 2021 год. В целях снижения рисков развития осложнений у пациентов старшей возрастной группы в период пандемии COVID-19 нашла обоснование обязательная их превентивная госпитализация, направленная на раннее начало лечения, круглосуточное наблюдение и своевременное медицинское вмешательство. В статье для оценки эффективности проводимых мероприятий в период пандемии были проанализированы данные превентивной госпитализации за 2021 год, организованной в одном из крупнейших районов города Санкт-Петербурга, насчитывающем до полумиллиона жителей. Полученные результаты исследования позволяют утверждать, что своевременная превентивная госпитализация положительно влияет на снижение смертности среди лиц старше 65 лет и может рассматриваться как способ повышения качества и безопасности медицинской помощи.

КЛЮЧЕВЫЕ СЛОВА: COVID-19, пожилой и старческий возраст, лица старше 65 лет, заболеваемость COVID-19, смертность от COVID-19, превентивная госпитализация

INTRODUCTION

In modern conditions, undesirable events in health care are understood as facts and circumstances that threaten to cause or have caused harm to the life and health of citizens, as well as facts and circumstances that have led to prolongation of the terms of medical care. Undesirable events seriously affect the quality of medical activity and remain an urgent problem of modern healthcare [1–3]. Despite the end of the COVID-19 pandemic, the number of new pathogens has increased in recent years, as well as known but mutated pathogens, which has led to their acquisition of new pathogenic properties, as well as properties that deprive them of sensitivity to the action of the defense mechanisms of the human body. For this reason, diseases, including COVID-19, acute respiratory viral diseases (ARVI) and influenza, sometimes began to acquire unexpected variants of course. Tolerance of infectious agents to drugs is growing, which may cause severe disease course.

A new coronavirus infection (COVID-19) poses a particular threat to the elderly and seniors [4, 5]. Despite the fact that all age groups are equally at risk of COVID-19 infection, the development of serious complications and death in the elderly as a result of infection is 2.43 times higher than in young and middle-aged people [6, 12]. According to the Russian Association of Gerontologists and Geriatricians, mortality from COVID-19 in people 80 years and older can reach 15%, while in people under 50 years of age it is less than 0.5% [13, 14].

Currently, 16.5% of the country's residents are in the age group of 65 years and older. According to international criteria, the population is considered old if the share of people aged 65 years and older in the whole population exceeds 7% [7]. According to the Federal State Statistics Service, the population of the city of St. Petersburg is one of the oldest among the other subjects of the Russian Federation, where the proportion of people over 65 years of age is 17% (924,453 people out of 5,600,044 permanently residing citizens according to the Federal Service for State Statistics (Rosstat) for 2023) [8–10].

Among the main reasons for the increased vulnerability of elderly and senile people are the decrease in physiological reserves, general resistance and stability of the organism, and the presence of a number of chronic diseases. The most common comorbid conditions in the elderly, which adversely affect the course and outcome of the disease, are cardiovascular (coronary heart disease, arterial hypertension), endocrinological (diabetes mellitus), rheumatic diseases, chronic lung diseases and malignant neoplasms [11]. In addition, patients with two or more comorbidities may have a poorer prognosis than patients with a single comorbidity.

Elderly patients, due to decreased body reactivity, usually present with an atypical disease pattern without fever and cough. COVID-19 symptoms may be mild, not corresponding to the severity of the disease and the seriousness of the prognosis. From an immunological point of view, the peculiarities of the immune system of the elderly may contribute both to the deficiency of effector mechanisms necessary to combat viral pathogens and to the exacerbation of the inflammatory response, which may accelerate and intensify lung tissue damage. Thus, older individuals with comorbidities, despite the presence of mild symptoms, are at higher risk of developing a severe course of COVID-19, unpredictable and rapid deterioration. Consequently, patients older than 65 years of age should be classified as a high-risk group for COVID-19 mortality.

AIM

To evaluate the effectiveness of preventive hospitalization of patients over 65 years of age with COVID-19 in the St. Petersburg in the 2021.

MATERIALS AND METHODS

To assess the effectiveness of the measures taken during the pandemic, data on preventive hospitalization for the year 2021, organized in one of the largest districts of the St. Petersburg with up to half a million inhabitants, were analyzed. To realize this goal, a quarterly assessment was carried out. The following parameters were assessed:

- dynamics of COVID-19 morbidity and mortality among persons of all age groups and over 65 years of age;
- the number of emergency ambulance crew visits to persons over 65 years of age for COVID-19 symptoms and the number of their hospitalizations;
- dynamics of preventively hospitalized patients over 65 years of age and their mortality from COVID-19.

RESULTS AND DISCUSSION

Given the increased risk of mortality, preventive hospitalization can be an effective measure to prevent the development of severe or fatal disease in patients over 65 years of age with COVID-19. Preventive medicine is a direction in modern medical science and practice, at the head of which is the preservation of patient's health by preventing the development of various diseases and pathologies.

Its main objectives are:

- reduction of home mortality of persons over 65 years of age;
- reduction of daily mortality in hospital;
- reduction of hospital mortality of patients over 65 years of age;

- prevention of risks of complications from COVID-19 and related diseases in persons over 65 years of age;
- timeliness of medical care, including in emergency and urgent forms, in case of complications from COVID-19 and related diseases.

Preventive hospitalization of patients over 65 years of age with COVID-19 has been actively developed in the St. Petersburg in order to maximally prevent the development of complications and mortality in this category of patients.

The following target groups formed the basis of the present study:

- patients hospitalized for epidemiological indications (in the presence of COVID-19 contact);
- patients with clinical manifestations of COVID-19 (the mild form);
- patients with other manifestations of somatic diseases using a rapid test for COVID-19, including for decision-making on outpatient care to reduce the risks of COVID-19 infection and spread.

The decision on the need for hospitalization of these patients was made by a doctor based on a set of clinical and epidemiological data, taking into account the severity of the patient's condition (medium/severe course of the disease) and the requirements stipulated by the Order of the Ministry of Health of the Russian Federation No. 198n of 19.03.2020 "On the temporary procedure for organizing the work of medical organizations in order to implement measures to prevent and reduce the risks of COVID-19 spread".

In order to consider the potential advantage of preventive hospitalization, we analyzed for 2021 the dynamics of morbidity and mortality from COVID-19 among people of all age groups and over 65 years of age in particular, as well as data on hospitalizations of elderly people in medical organizations re-profiled to provide medical care to patients with COVID-19 in inpatient settings. The study of COVID-19 patients showed slight fluctuations in the number of patients in the age group over 65 years with COVID-19 throughout 2021, which is not typical of the total number of patients throughout 2021 (Fig. 1). According to the results, there was an increasing trend in the number of COVID-19 cases since the beginning of 2021,

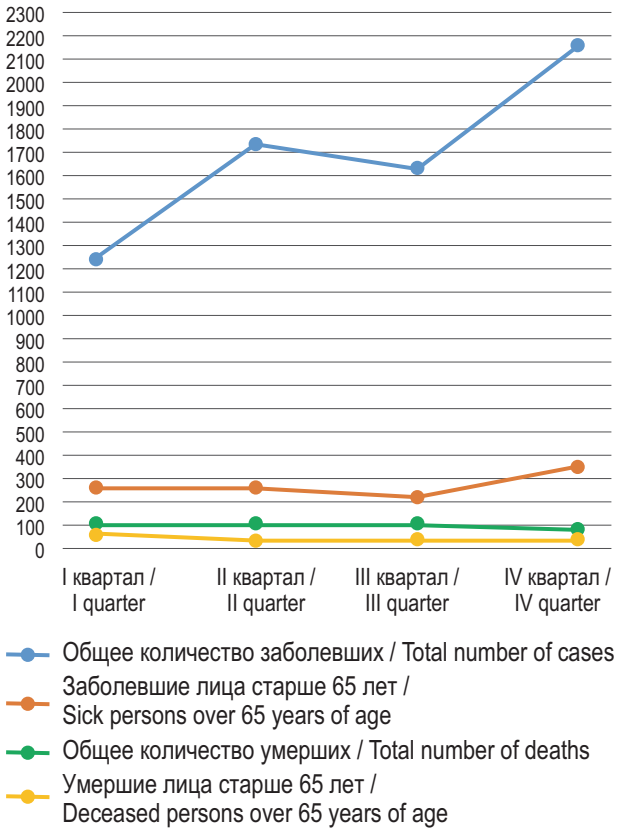

Fig. 1. Dynamics of morbidity and mortality of persons with COVID-19 of all age groups and persons over 65 years of age (2021)

Рис. 1. Динамика заболеваемости и смертности лиц с COVID-19 всех возрастных групп и лиц старше 65 лет (2021)

both among all age groups and among those over 65 years of age. For the I quarter, the number of patients was 1242, of whom over 65 years of age it was 258 people (20.8% of the total number of patients), for the II quarter it was 1738, of whom over 65 years was 260 (14.9%), for the III quarter it was 1634 people, the number of persons over 65 years of age was 225 people (13.8%), at the end of the IV quarter (data up to 28th of December) it was 2310 and 356 people respectively (15.4%). Thus, in general, absolute decrease in the share of the sick people aged 65 years and older made 5.4% (or 98 cases) by the IV quarter. The growth rate of the sick people over 65 years old in the IV quarter against the level of the I quarter was 27.5%.

The total number of deaths for the I quarter of 2021 was 108, for the II quarter it was 100, for the III quarter it was 96 and for the IV quarter it was 85. Among them, 56 persons over 65 years

of age (51.8% of all deaths) died in the I quarter, 31 (31.0%) in the II quarter, 27 (28.2%) in the III quarter and 24 (28.0%) in the IV quarter. Absolute decrease in the share of deaths over 65 years old by the IV quarter made 22.8% (or 32 deaths). In general, the rate of decrease in the IV quarter to the level of the I quarter reached 57.1%. The obtained data show that against the background of the increase in the number of patients since the beginning of 2021, there was a positive dynamics of reduction in the number of deaths from COVID-19, which can be indirectly regarded as an effective impact of vaccination among the population.

However, it is worth noting that despite the efforts made and the introduction of mandatory preventive hospitalization for the elderly, seniors and long-livers, the proportion of hospital admissions among those over 65 years of age is extremely low. In the I quarter of 2021 it was 30.6%, in the II quarter 31.5%, in the III quarter 44.8% and at the end of the IV quarter 41.3%. The data in absolute numbers is presented in Figure 2.

The development of this situation, in our opinion, is related to the distrust of patients and their relatives in the quality of treatment and care for the elderly, as well as to the prejudice towards the national health care system as a whole, which during the pandemic was caused by the widespread dissemination of negative information about its activities in the media and on the Internet. All of this facts could have caused a large number of refusals of hospitalization on the part of this category of patients. After analyzing the studies on predicting the risks associated with hospitalization of COVID-19 patients, we concluded that reliable clinical studies on this issue are currently lacking.

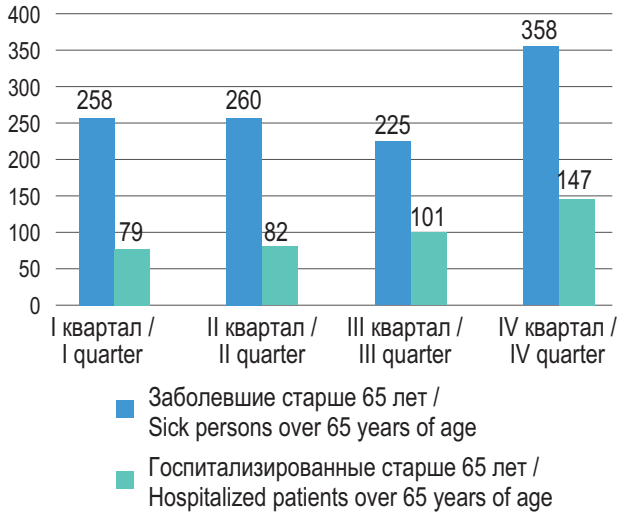

Fig. 2. Number of people over 65 years of age ill with COVID-19 and number of hospitalized people over 65 years of age among people with COVID-19 (2021)

Рис. 2. Количество заболевших COVID-19 лиц старше 65 лет и количество госпитализированных среди заболевших COVID-19 лиц старше 65 лет (2021)

We analyzed the data on emergency ambulance visits to persons over 65 years of age for COVID-19 symptoms and their preventive hospitalization, as well as the subsequent dynamics of mortality among this contingent for a more accurate assessment of the effectiveness of preventive hospitalization (Table 1).

The results show that since the beginning of 2021, the proportion of people preventively hospitalized by ambulance has been steadily increasing and reached 98% in the IV quarter, which is a good indicator.

In addition, there is a positive trend in the reduction of mortality among preventively hospitalized patients (Fig. 3). It was found that with an increase in the number of hospitalizations by 46.3% there was a decrease in the number of deaths by 73.7%.

The findings directly indicate that as the number of preventively hospitalized patients increased, the number of COVID-19 deaths gradually decreased throughout 2021. This fact confirms the importance and necessity of preventive hospitalization of older patients with COVID-19 in order to prevent complications and deaths.

CONCLUSION

1. The category of elderly citizens with suspected or confirmed COVID-19 is the most vulnerable to the rapid development and aggravated course of infection, which is confirmed by the high morbidity rate among this category of patients.

2. Hospitalization rates and morbidity rates are increasing in parallel with decreasing of the mortality in all age groups of patients.

3. COVID-19 coronavirus infection is a concept associated with increased mortality in persons over 65 years of age with associated pathological conditions such as cardiovascular disease, chronic respiratory disease, diabetes mellitus, cancer and others that exacerbate the course of viral infections.

Table 1

Analysis of the number of visits by emergency medical teams to persons over 65 years of age regarding symptoms of COVID-19 and their hospitalizations (2021)

Таблица 1

Анализ количества выездов бригад скорой медицинской помощи к лицам старше 65 лет по поводу симптомов COVID-19 и их госпитализаций (2021)

Период / Period Характеристика / Characteristics	I квартал / I quarter	II квартал / II quarter	III квартал / III quarter	IV квартал / IV quarter
Количество выездов бригад скорой медицинской помощи к лицам старше 65 лет по поводу симптомов COVID-19 / Number of visits by emergency medical teams to people over 65 years of age regarding symptoms of COVID-19	105	103	117	150
Количество госпитализированных лиц старше 65 лет с установленным и вероятным диагнозом COVID-19 / Number of hospitalized persons over 65 years of age with an established and primary diagnosis of COVID-19	79	82	101	147
Доля госпитализированных лиц старше 65 лет, доставленных бригадами скорой медицинской помощи, с установленным и вероятным диагнозом COVID-19, % / Proportion of hospitalized persons over 65 years of age delivered by ambulance teams with an established and primary diagnosis of COVID-19, %	75	80	86	98

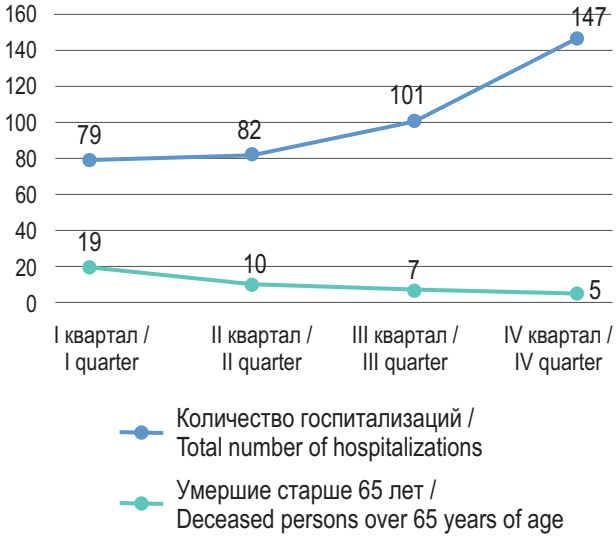

Fig. 3. Dynamics of the number of preventively hospitalized patients over 65 years old and their mortality from COVID-19 (2021)

Рис. 3. Динамика числа превентивно госпитализированных пациентов старше 65 лет и их смертности от COVID-19 (2021)

4. Even though the course of the disease is mild, preventive hospitalization is mandatory to prevent lightning COVID-19 and possible complications, as in hospital patients can receive a full range of not only drug treatment, but also oxygen therapy, 24-hour medical supervision.

5. The experience of the work done on the organization of hospitalization during the pandemic, as well as in the subsequent period, allows us to consider the tactics of preventive hospitalization of persons over 65 years of age as expedient in modern conditions, including outside the epidemic (pandemic).

Thus, the results of the study give the right to assert that preventive hospitalization of persons over 65 years of age is one of the ways to improve the quality and safety of medical care for this category of patients and makes it possible to largely avoid additional risk to their life and health.

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.

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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UDC 616.314-082-084-053+614.812+316.728+728.1
DOI: 10.56871/MHCO.2024.95.43.006

SCIENTIFIC SUBSTANTIATION OF THE MEDICAL SERVICE MODEL IN URBAN AGGLOMERATIONS USING THE EXAMPLE OF THE DENTAL SERVICE OF SAINT PETERSBURG

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For citation: Orel VI, Klimov AG, Filatova OO. Scientific substantiation of the medical service model in urban agglomerations using the example of the dental service of Saint Petersburg. Medicine and Health Care Organization. 2024;9(2):52–59.
DOI: https://doi.org/10.56871/MHCO.2024.95.43.006

Received: 20.05.2024 ***Revised: 18.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. The article highlights the problem of making conditions for accessibility to all types of dental care for the population living in rapidly growing areas of St. Petersburg. As a solution of the problem, the authors propose to establish dental departments based on central polyclinics, as well as to revise and improve the organization of dental services in areas with mass residential construction by incorporating these departments into the structure of residential complexes, where patients can receive primary medical and sanitary assistance. Such a system will help reduce the burden on central polyclinics and ensure the availability of dental care for all population groups. Additionally, the article provides recommendations on equipping residential complexes with medical equipment, construction, and staffing standards demanded for central polyclinics and dental departments. The article considers a model of forming out a dental department on an example the St. Petersburg State Budgetary Healthcare Institution "Dental Polyclinic № 4" of the Vyborgsky District.

KEYWORDS: dental service organization, medical care provision, dental morbidity, dental department, mass residential development

НАУЧНОЕ ОБОСНОВАНИЕ МОДЕЛИ МЕДИЦИНСКОГО ОБСЛУЖИВАНИЯ В ГОРОДСКИХ АГЛОМЕРАЦИЯХ НА ПРИМЕРЕ СТОМАТОЛОГИЧЕСКОЙ СЛУЖБЫ САНКТ-ПЕТЕРБУРГА

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Для цитирования: Орел В.И., Климов А.Г., Филатова О.О. Научное обоснование модели медицинского обслуживания в городских агломерациях на примере стоматологической службы Санкт-Петербурга // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 52–59. DOI: https://doi.org/10.56871/MHCO.2024.95.43.006

Поступила: 20.05.2024 ***Одобрена: 18.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. В статье освещается проблема организации доступности всех видов стоматологической помощи для населения, проживающего в условиях стремительно растущих районов

Санкт-Петербурга. В качестве решения авторы предлагают создать на базе центральных поликлиник стоматологические отделения, а также пересмотреть и усовершенствовать организацию стоматологической службы в районах с массовой жилой застройкой путем инкорпорирования данных отделений в структуру жилых комплексов, где пациенты смогут получать первичную медико-санитарную помощь. Подобная система позволит снизить нагрузку на центральные поликлиники и обеспечить доступность стоматологической помощи для всех групп населения. В статье также даны рекомендации по оснащению медицинским оборудованием, строительным и штатным нормативам для центральных поликлиник и стоматологических отделений. В качестве примера разработана модель стоматологического отделения на базе СПб ГБУЗ «Стоматологическая поликлиника № 4» Выборгского района.

КЛЮЧЕВЫЕ СЛОВА: организация стоматологической службы, оказание медицинской помощи, стоматологическая заболеваемость, стоматологическое отделение, массовая жилая застройка

INTRODUCTION

According to the Federal Service for State Statistics (Rosstat), on the 1st of January 2023, the population of the Russian Federation is 146,447,424 people [1], each of whom has the right to receive medical care, which is regulated by the relevant order on the provision of medical care [2]. There are 1120 cities in Russia at the beginning of 2024. In accordance with the rules "Urban development. Planning and development of urban and rural settlements" (Code of Rules 42.13330.2016) from the Ministry of Construction of Russia, the country's cities are classified by the number of population as follows:

- the largest: population is over 1 million people;
- large: from 250 thousand to 1 million people (including subcategories from 250 thousand to 500 thousand and from 500 thousand to 1 million people);
- large: between 100,000 and 250,000 people;
- medium: from 50 to 100 thousand people;
- small: up to 50 thousand people (including subcategories up to 10 thousand, from 10 to 20 thousand and from 20 to 50 thousand people); this also includes urban-type settlements [3].

St. Petersburg is one of the largest cities in the Russian Federation with a population of 5,600,044 people [4]. The city is a major industrial center, where machine building, energy and chemical industries are actively developing. In addition, St. Petersburg plays a key role in the Russian economics, representing an important transport hub and a center of innovative and cultural initiatives. In the period from 2020 to 2023, the adult and child population of St. Petersburg increased by an average of 15,000 people per year (Fig. 1) [5].

Taking into account population growth and constant changes in health care, including the development of medical technologies, reforms and improvements in legislation, it becomes necessary to regularly analyze the effectiveness and accessibility of medical care. It is worth noting that dental care is among the most mass types of medical care. It ranks second in terms of demand after general practitioners [6]. The share of dental diseases in the structure of general morbidity of the population of St. Petersburg, taking into account the turnover, varies within 20–25%. This corresponds to the number

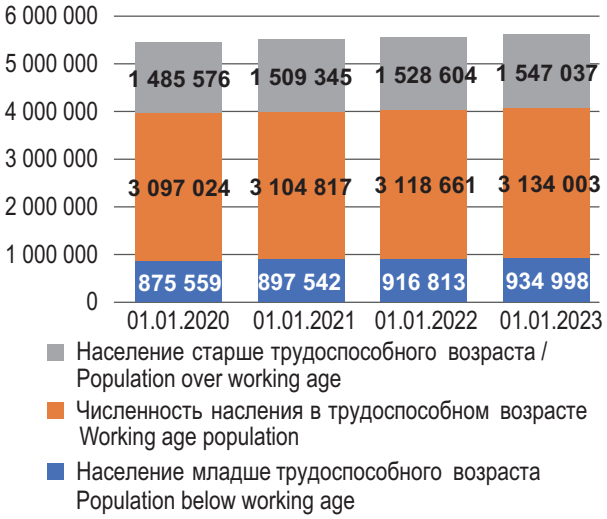

Fig. 1. Changes in the population of St. Petersburg from 2020 to 2023

Рис. 1. Изменения численности населения Санкт-Петербурга в период с 2020 по 2023 годы

of cases from 345 to 550 per 1000 inhabitants. At the same time, in 99% of cases patients are served in outpatient and polyclinic institutions [7]. Polyclinics are located according to the principle of staggered arrangement taking into account medical and sanitary zones and have three levels of organization.

1) City-wide level, which, in turn, is designed to provide highly specialized medical care to the population of the entire city in city-level polyclinics, such as consultative and polyclinics of medical universities, research institutes and city dispensaries.
2) The level of medical and sanitary zones is organized to provide specialized care to the population of several administrative districts in large cities (consultative polyclinics at multidisciplinary hospitals).
3) District level is organized to provide medical care in the main medical specialties to the population of one administrative district.

The district level includes two types of polyclinics: typical and basic. Typical polyclinics provide medical care in the main specialties (therapy, surgery, ophthalmology, neurology, cardiology, otorhinolaryngology, rheumatology), and basic polyclinics, in addition to reception in the main specialties, organize reception and consultation of patients in specific specialties, which are absent in typical polyclinics [8, 9].

At present, dental polyclinics are distributed heterogeneously, mainly in the historical center of the city, while in such districts as Vyborgsky, Krasnoselsky, Kolpinsky and part of Primorsky, where mass construction of residential complexes is underway, state medical institutions are often absent. This is due to the fact that the design and development of new residential complexes does not involve the construction of dental and general medical clinics. When settling such agglomerations, there is a problem with access to medical care, which leads to social tension among residents. The issue is especially acute for low-mobility groups, children and elderly citizens, for whom walking distance to a medical facility plays a key role. Moreover, there are a number of restrictions related to the location of medical facilities, including dental clinics, in residential buildings. These restrictions relate to ventilation, location of X-ray diagnostic machines and other aspects, which entail additional difficulties. Thus, the above problems directly affect the availability of medical services and worsen the social situation in the city. The creation of new medical facilities adapted to the needs of the population and the expansion of the network of dental polyclinics in new districts through the creation of subsidiary dental units become strategically important steps towards affordable qualified care. This will reduce the load on existing medical facilities, provide faster access to medical care and maintain a high level of care for the health of citizens.

AIM

The aim is to develop a strategy for the development of dental services in the Vyborgsky district of St. Petersburg in places with mass residential development on the example of the dental department of the St. Petersburg State Budgetary Institution “Dental Polyclinic No. 4”.

MATERIALS AND METHODS

In order to implement the health service strategy, the state of the dental service in St. Petersburg was analyzed for the years 2020–2023. Currently there are 59 dental polyclinics in the districts, of which 11 are children’s and 48 adult dental polyclinics. There are also 25 health centers in the city, 5 of which are children’s centers, and in each of them there is an opportunity to provide hygiene education and training for children and to activate antenatal prevention of dental diseases. For the implementation of preventive examinations of children in general education institutions the possibilities of two mobile dental complexes are involved. The main indicators of dental morbidity among the child and adult population of St. Petersburg are lower than the national average, which may indicate a high organization of the city’s dental service and a fairly effective system for detecting dental diseases. However, it should be noted that St. Petersburg lacks a programof primary prevention of dental diseases in the child population. The analysis also revealed three districts with a deficit of dental care: Primorsky, Krasnoselsky and Kolpinsky. Primorsky district is the 1st in terms of population (699,243 people), as a result of this dental polyclinics cannot cope with the flow of patients seeking care. In Krasnoselsky

(431,546 people) and Kolpinsky (186,169 people) districts, dental polyclinics are located far away from new buildings, which creates certain difficulties for their residents in accessing medical care. However, we chose Vyborgsky district, which has the 3rd largest population among all districts of St. Petersburg, to implement a strategy for the development of dental services. The district includes 104,423 children and 437,167 adults, which gives it significant importance in light of the total number of residents. It should be noted that this district is dynamically developing, with a constant increase in new residential complexes (Fig. 2).

We have developed a project for the construction of a dental department of the St. Petersburg State Budgetary Institution "Dental Polyclinic No. 4" in a residential building at the address: Bolshoi Sampsonievsky Avenue, 32, St. Petersburg. According to the project plan, the space provided has a commercial purpose, but we decided to locate the dental department there.

The dental department is located on the 1st floor of a residential building and is a structural subdivision of the St. Petersburg State Budgetary Institution "Dental Polyclinic No. 4". The total area of the premises is 89.48 m², which allows to organize 2 full-fledged working rooms for 2 dental units and 4 posts of a dentist.

The total capacity of the dental department — up to 20 visits per day, the approximate number of served population. The dental department includes the structural units presented in Table 1.

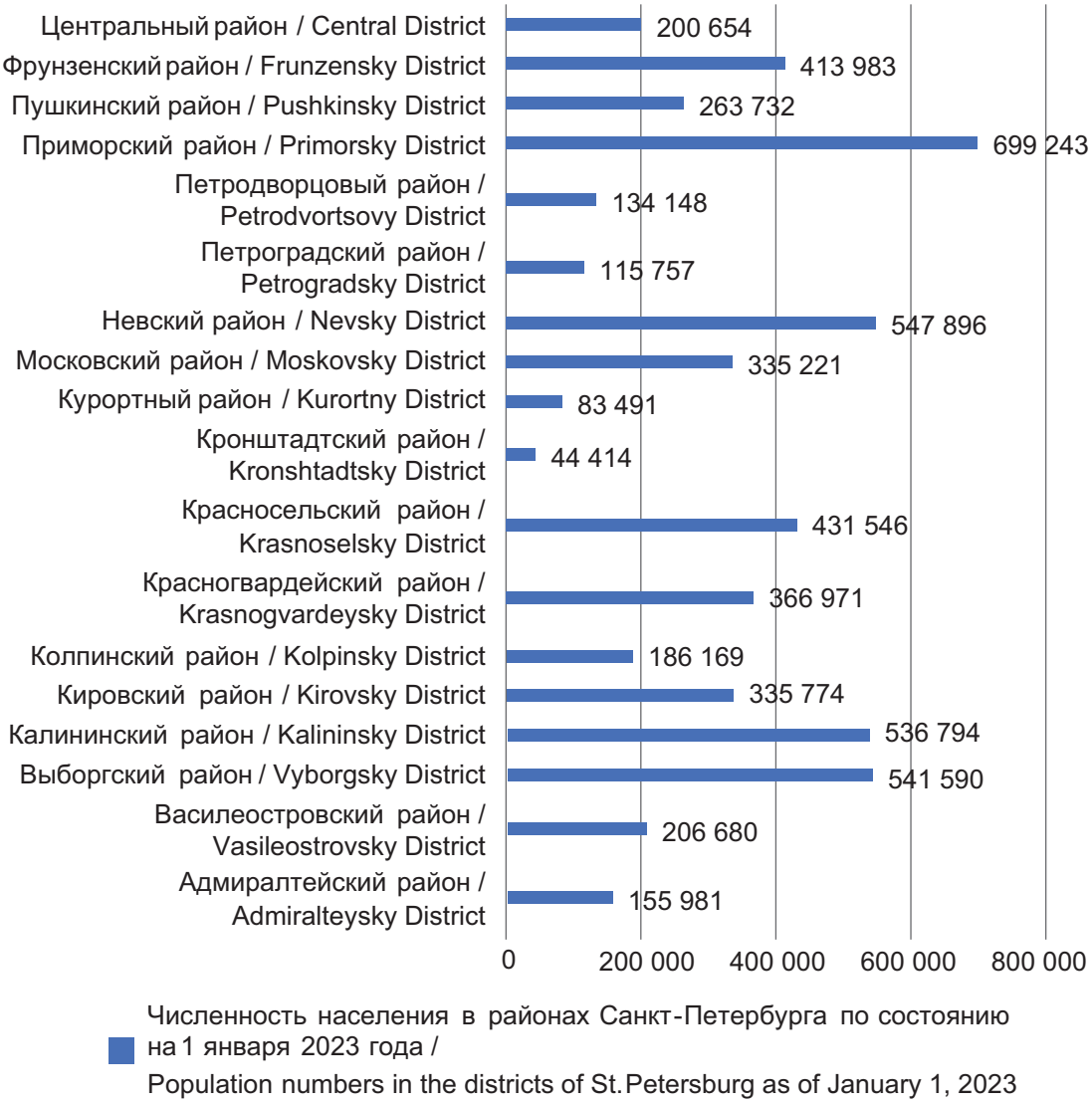

Fig. 2. Numbers of inhabitants in the districts of St. Petersburg as in January 1, 2023

Рис. 2. Численность населения в районах Санкт-Петербурга по состоянию на 1 января 2023 года

Staff standards are formed in accordance with the order of the Ministry of Health of the Russian Federation dated 31 July 2020 No. 786n [10] on the order of medical care for adults with dental diseases and are presented in Table 2.

The working mode of the staff of the dental department is two-shift. An essential aspect is the fact that all premises in residential complexes are provided by the developer, have a commercial purpose and are not intended to accommodate medical institutions. In this regard, each department must be modified to meet the relevant regulations, and this entails certain difficulties.

The list of requirements for a dental unit covers a variety of aspects, based on compliance with regulations and laws of the Russian Federation, including room dimensions, interior finishes, and heating, ventilation and water supply systems [11]. Ramps are an important component in ensuring accessibility of a barrier-free environment for persons with disabilities [12]. Security is also in the center of attention; therefore the institution should be equipped with security and alarm systems, automatic fire protection and video surveillance with the possibility of long-term storage of records. These requirements are supplemented by the arrangement of platforms in front of entrances, including for groups with reduced mobility, and light shelters for prams [13, 14]. An integral part is to equip the premises with the necessary fire-fighting equipment, city telephone communication and high-speed Internet. An important aspect is also a structured cable network integrated with structural subdivisions of the medical center, as well as metering systems for water supply and electricity. A backup source of hot water (boiler) in the hot water supply system should also be provided. Compliance with hygiene standards for both water and microclimate parameters and air exchange in the premises is an indispensable condition [15]. Structural elements such as floors and walls must be impermeable to rodents. Lighting, insolation, noise and vibration levels should also meet the established hygienic standards. Each room should be equipped with a selector communication system, emergency lighting, a local computer network and radio and television network points. Ventilation and air conditioning systems are provided for the compressor room and X-ray diagnostics room [16]. A dental unit located in an apartment block should be provided with a separate ventilation and air recovery system, isolated from the general building ventilation system and excluding air backflow from the rooms inside the unit with purity class A [17]. Taking into account the above aspects, from the power supply points, to the connection of the dental unit premises to the water supply system, to the installation of the necessary medical equipment, it is possible to guarantee the efficient operation of the dental unit in accordance with high standards of safety and comfort.

CONCLUSION

According to our opinion, the dental service in areas with mass residential development should look as follows: a central polyclinic located in one or another part of the district, including dental departments in its structure. In the central polyclinic, specialists provide high-tech medical care and perform complex multi-stage medical interventions. In addition, the central polyclinic includes a radiology department, which has a dental computer tomograph and other radiology equipment for more detailed examination of patients; a dental laboratory; a central sterilization department, which provides processing and sterilization of medical instruments, including dental units; and an administrative building. Dental departments are premises with an area of at least 80 m^2, located on the ground floors of residential complexes and providing primary health care. This structure will allow to optimize the load on dental departments located more distant from the central polyclinic, reduce financial costs and solve the problem of accessibility of dental care to the population in areas with massive residential development. In order to ensure accessibility and improve the quality of dental care, it is recommended to integrate dental departments of central district polyclinics as mandatory structural units in existing and planned residential complexes.

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.

Table 1

List of required premises with indicated minimum useful area

Таблица 1

Перечень необходимых помещений с указанием минимальной полезной площади

№	Наименование помещений / Room names	Количество помещений в соответствии с мощностью поликлиники (по числу врачебных посещений) / The number of rooms according to the capacity of the polyclinic (based on the number of medical visits)	Площадь помещений, м² / Room area, m²	Итоговая площадь, м² / Total area, m²
1	Колясочная на улице / Крытая колясочная Outdoor stroller parking / Covered stroller room	–	20	20
2	Гардеробная для посетителей и персонала (встроенный шкаф) в холле / Cloakroom for visitors and staff (built-in wardrobe) in the lobby	–	–	–
3	Санитарный узел для работников и посетителей / Sanitary facilities for employees and visitors	–	–	–
3.1	Помещение санитарного узла / Restroom	1	5,10	5,10
3.2	Помещение санитарного узла для детей / Restroom for children	1	3,85	3,85
4	Ординаторская / Residents' room	–	–	–
4.1	Помещение для медперсонала / Staff room	1	8,42	8,42
4.2	Уличный тамбур / Outdoor vestibule	1	5,46	5,46
5	Помещение для хранения уборочного инвентаря / Storage room for cleaning equipment	–	–	–
5.1	Помещение для хранения уборочного инвентаря, место для хранения отходов класса Б / Storage room for cleaning equipment, waste storage area for Class B waste	1	3,75	3,75
6	Компрессорная / Compressor room	1	3,61	3,61
7	Стоматологический кабинет / Dental office	–	–	–
7.1	Стоматологический кабинет на 2 стоматологические установки / Dental office with 2 dental units	1	25,96	25,96
8	Rg-кабинет (радиовизиограф) / X-ray room	1	6,06	6,06
9	Регистратура и холл / Reception and lobby	1	27,27	27,27

Table 2

Planned staffing schedule by facility

Таблица 2

Планируемое штатное расписание по объекту

№	Наименование должности / Position title	Количество должностей / Number of positions	Количество должностей в смену / Number of positions per shift
1	Врач стоматолог-терапевт / Dentist-therapist	4 должности / 4 positions	2 должности / 2 positions
2	Медицинская сестра / Medical nurse	2 должности / 2 positions	1 должность / 1 position
3	Медицинский регистратор / Medical registrar	2 должности / 2 positions	1 должность / 1 position
4	Санитарка / Sanitary worker	2 должности / 2 positions	1 должность / 1 position
5	Уборщик служебных помещений / Cleaning staff for service areas	2 должности / 2 positions	1 должность / 1 positions
Итого / Total:		12	6

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

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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UDC 616.833.17-009.11+612.819.7+616.85+614.812
DOI: 10.56871/MHCO.2024.64.49.007

EPIDEMIOLOGIC CHARACTERISTICS OF FACIAL NERVE DISEASES IN A METROPOLIS ACCORDING TO THE UNIFIED MEDICAL CITY SYSTEMS

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For citation: Shamalov NA, Zavaliy LB, Petrikov SS, Ramazanov GR, Tyrov IA, Koriagin AN, Fomkin AG, Kuular DV, Nikulina TA, Andriyanova EV. Epidemiologic characteristics of facial nerve diseases in a metropolis according to the unified medical city systems. Medicine and Health Care Organization. 2024;9(2):60–69. DOI: https://doi.org/10.56871/MHCO.2024.64.49.007

Received: 26.04.2024 ***Revised: 03.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. Treatment of patients with diseases of the facial nerve (FN) is an important medical and social problem. It is highly relevant, but there are no recent epidemiological data on the prevalence of movement disorders in the facial area. An analysis of the epidemiological characteristics of facial nerve diseases is presented. The study conducted was based on the data taken from the Unified Medical Information and Analytical System (UMIAS) for 2019–2021. Cases of the first visit of a patient with a disease code group G51 were analyzed. 95% of the registered population of the metropolis is connected to the electronic system of the local polyclinics , therefore the number of patients with diseases of the facial nerve was counted per 100,000 attached population for each nosological unit separately in two categories — adults and children. The incidence of the idiopathic form of facial neuropathy in the adult population is 15.5 people per 100,000, symptomatic forms — 13.7, clonic hemifacial spasm — 1.2, Ramsay Hunt syndrome — 0.6, Rossolim–Malkersson–Rosenthal syndrome — 0.1. The incidence of the facial myokymia is 0.7 people per 100,000 population. The median age of adult patients was 40–50 years, women prevailed. The incidence among children and adolescents of the idiopathic form of facial nerve neuropathy is 9.6 people per 100,000, symptomatic forms — 11.8, Ramsay Hunt syndrome — 0.2. The median age in the group of children and adolescents varied depending on the pathology form from 8 to 16 years; no differences associated with gender were defined. An analysis of the epidemiology of FN diseases in Moscow for 2019–2021 was carried out. This became possible after the implementation of the UMIAS system. The UMIAS system opens up the possibility of obtaining reliable epidemiological data and can be offered as a single centralized mechanism for collecting and managing data.

KEYWORDS: facial nerve, facial nerve neuropathy, Bell's palsy, Ramsay Hunt syndrome, Rossolim–Malkersson–Rosenthal syndrome, hemifacial spasm, facial myokymia

ЭПИДЕМИОЛОГИЯ ЗАБОЛЕВАНИЙ ЛИЦЕВОГО НЕРВА В МЕГАПОЛИСЕ ПО ДАННЫМ ЕДИНОЙ МЕДИЦИНСКОЙ СИСТЕМЫ ГОРОДА

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Для цитирования: Шамалов Н.А., Завалий Л.Б., Петриков С.С., Рамазанов Г.Р., Тыров И.А., Корягин А.Н., Фомкин А.Г., Куулар Д.В., Никулина Т.А., Андриянова Е.В. Эпидемиология заболеваний лицевого нерва в мегаполисе по данным единой медицинской системы города // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 60–69. DOI: https://doi.org/10.56871/MHCO.2024.64.49.007

Поступила: 26.04.2024 ***Одобрена: 03.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. Помощь пациентам с заболеваниями лицевого нерва (ЛН) является важной медико-социальной задачей. Несмотря на высокую актуальность, современные эпидемиологические данные о распространенности двигательных расстройств в области лица отсутствуют. Цель работы — проведение анализа эпидемиологических характеристик заболеваний ЛН в г. Москве. Исследование проведено по данным Единой медицинской информационно-аналитической системы (далее — ЕМИАС) за 2019–2021 гг. Учитывали случаи первичного обращения пациента с кодом заболевания группы G51. К городским поликлиникам прикреплено 95% зарегистрированного населения мегаполиса, поэтому расчет количества пациентов с заболеваниями лицевого нерва производили на 100 000 прикрепленного населения по каждой нозологической единице отдельно в двух категориях — взрослые и дети. Заболеваемость взрослого населения идиопатической формой нейропатии лицевого нерва составляет 15,5 человек на 100 000 населения, симптоматическими формами нейропатии лицевого нерва — 13,7, клоническим гемифациальным спазмом — 1,2, синдромом Рамсея Ханта — 0,6, синдромом Россолимо–Мелькерссона–Розенталя — 0,1. С лицевой миокимией обращаются 0,7 человек на 100 000 населения. Медиана возраста взрослых пациентов составила 40–50 лет, преобладали женщины. Заболеваемость среди детей и подростков идиопатической формой нейропатии лицевого нерва составляет 9,6 человек на 100 000 населения, симптоматическими формами нейропатии лицевого нерва — 11,8, синдромом Рамсея Ханта — 0,2. Медиана возраста в группе детей и подростков варьировала в зависимости от патологии от 8 до 16 лет, статистически достоверных различий по полу не выявлено. Впервые представлен анализ эпидемиологических характеристик заболеваний ЛН за 2019–2021 гг., что стало возможным благодаря внедрению системы ЕМИАС. Система ЕМИАС открывает возможности получения достоверных эпидемиологических данных и может быть предложена как единый централизованный механизм сбора и управления данными.

КЛЮЧЕВЫЕ СЛОВА: лицевой нерв, нейропатия лицевого нерва, невропатия лицевого нерва, паралич Белла, синдром Рамсея Ханта, синдром Россолимо–Мелькерссона–Розенталя, клонический гемифациальный спазм, лицевая миокимия

INTRODUCTION

Facial distortion in people causes dramatic thoughts up to suicidal thoughts, leads to social disadaptation, and isolation. Therefore, medical care for patients with facial nerve (FN) damage of various genesis is an important medical and social problem [1–4]. Diseases associated with facial nerve damage are classified in a separate group of the International Classification of Diseases (ICD-10) with codes G51.0-G51.9 [5].

Facial nerve neuropathy (FNN) is characterized by degenerative changes in the FN, clinically manifested by the development of facial asymmetry due to unilateral paresis and/or plegia of mimic muscles, restriction of eye closure, lacrimation or dryness of the eye, possible taste and hearing disorders [6]. The idiopathic form of FNN (Bell's palsy, ICD-10 code G51.0) resolves in 60–70% of cases with restoration of FN [7, 8]. In the remaining patients, the consequences in the form of facial asymmetry remain and complications develop, which may progress over time, such as hypertonicity of mimic muscles up to the onset of pain syndrome, synkinesis, and others. The presented epidemiological data on the incidence of FNN are contradictory. The figures vary from 8 to 32 cases per 100,000 people per year, with an equal frequency of development among men and women, mainly at the age of 40–60 years. It should be noted that authors find patterns of disease development associated with seasonality (autumn) or weather conditions (temperature change), comorbid background (diabetes mellitus) [9–13].

Some FN diseases are listed in separate ICD-10 codes. Ramsay Hunt syndrome (G51.1) is a herpetic lesion of the patellar node, characterized by FNN with pain and skin rashes; the incidence is about 12% of all FNN [14, 15]. Rossolimo–Melkersson–Rosenthal syndrome (G51.2) is a genetic disorder characterized by FNN combined with swelling of the lips and tongue folding, the incidence is 0.8% of all FNN [16].

Hemifacial spasm (HFS) (G51.3) is manifested by chronic paroxysmal painless involuntary unilateral tonic or clonic contractions of facial muscles, including at rest. It may be primary (because of the compression of the nerve root by one of the vessels) and secondary (trauma, organic lesions of the brain stem, parotid gland tumors, etc.); the cause of development determines the tactics of treatment. In HFS condition of mimic muscles worsens over time, their weakness progresses, tone increases (the pain syndrome appears), asymmetry worsens. The incidence is 14.5 per 100,000 women and 7.4 per 100,000 men [17].

Other disorders of facial nerve (G51.8) include trauma, complications of surgical, cosmetic, and dental interventions, neurological diseases, infections, and metabolic disorders [18, 19]. In such cases, the percentage of unfavorable outcomes is significantly higher [20]. In clinical situations when the cause of FNN is not completely clear, the diagnosis of "Disorder of facial nerve, unspecified" (G51.9) is established. All of the above conditions require diagnosis and timely treatment, up to surgical treatment. Patients need to be monitored, as their clinical situation may get worse.

Facial myokymia (G51.4) — recurrent unilateral self-limiting, low-amplitude, pulsating twitching in one of the facial muscles (more often the circular muscle of the eye), occurring due to physical or emotional overstrain, caffeine consumption, etc., resolved independently after removal of the unfavorable factor. Healthy people of young age suffer, statistics are unknown [21–23]. In most cases, facial myokymia is not a disease. The condition is benign, but requires observation, as any involuntary movement may be the debut of one of the FN diseases.

In childhood, the idiopathic form of FNN predominates among facial nerve lesions. The incidence among persons under 10 years of age is 2.7 per 100,000 persons per year, among persons from 10 to 20 years of age it is 10.1. Moreover, the authors note a better response to prednisolone therapy and a better prognosis for recovery of nerve function in childhood [24].

Despite the high relevance of the problem of facial movement disorders, current epidemiological data on their prevalence are insufficient.

The way to obtain reliable epidemiological data is one of the important tasks of the health care system. For more than ten years Moscow has been following the path of digitalization of the healthcare system. During this time, a unified digital environment has been created, which is the basis for the development of a system of medical services for citizens and doctors. At present, medical organizations of the public health care system of Moscow are united by the Unified Medical Information and Analytical System (hereinafter — UMIAS) into a single

digital space for storage, analysis, exchange of clinical and diagnostic data between medical workers and patients.

AIM

The aim is to analyze the epidemiological characteristics of FN diseases in Moscow (morbidity, gender and age structure).

MATERIALS AND METHODS

The present study was conducted according to the data of UMIAS Moscow in dynamics for 2019–2021 years. Cases of primary treatment of a patient with ICD-10 disease code G51 were taken into account. Patients were divided into two age groups: adults and children/adolescents, as well as into groups by ICD-10 code G51.0-G51.9 (Table 1).

Next, we obtained data on the total number of attached populations to health care facilities in Moscow according to the UMIAS system for 2019, 2020 and 2021 and calculated the statistical indicator of morbidity per 100,000 population of the corresponding age group: the number of new cases relative to the attached population for each year for each disease in both groups. The sex and the age structure were then presented for each disease associated.

Statistical methods

Statistical hypothesis testing was performed using IBM SPSS 23.00 program. Descriptive statistics is given in the form of: absolute (n) and relative values (%), medians (Me), lower [C25] and upper [C75] quartiles. The data were checked for normality of distribution using the Shapiro-Wilk test. Nonparametric comparison criteria were used to compare two groups: Mann–Whitney (U) and chi-square test (χ^2). The $p \leq 0.05$ was taken as the level of statistical significance.

Terminology

Prevalence is a statistical indicator that estimates all existing cases per year per 100,000 population (in the relevant age group); morbidity considers only new cases [25].

Children and adolescents are persons under 18 years of age; adults are persons over 18 years of age.

RESULTS

According to the Federal Service for State Statistics (Rosstat), the number of permanent population in Moscow averages about 12.6 million people per year [26]. About 95% of them are registered in the UMIAS system (Table 2).

Accordingly, morbidity was calculated for the population attached to UMIAS — the number of new cases per 100,000 people per year, for each disease separately in two categories — both adults and children (Table 3).

Among FN diseases in adults, idiopathic neuropathy predominated, followed by symptomatic forms of other established and unidentified genesis, and hemifacial spasm. Ramsay Hunt syndrome and Rossolimo–Melkersson–Rosenthal syndrome have been recorded less frequently. Idiopathic and symptomatic forms of FNN predominate in childhood.

Table 1

International Classification of Diseases 10th Revision — Facial nerve disorders

Таблица 1

Группа заболеваний Международной классификации болезней-10 — Поражения лицевого нерва

Код МКБ-10 / Code ICD-10	Диагноз / Disease
G51.0	Паралич Белла / Bells palsy
G51.1	Воспаление узла коленца лицевого нерва (синдром Рамсея Ханта) / Geniculate ganglionitis (Ramsay Hunt syndrome)
G51.2	Синдром Россолимо–Мелькерссона–Розенталя / Rossolim–Malkersson–Rosenthal syndrome
G51.3	Клонический гемифациальный спазм / Clonic hemifacial spasm
G51.4	Лицевая миокимия / Facial myokymia
G51.8	Другие поражения лицевого нерва / Other disorders of facial nerve
G51.9	Поражение лицевого нерва неуточненное / Disorder of facial nerve, unspecified

Table 2

Average number of residents permanently residing in Moscow, as well as those related to EMIAS, dynamics for 2019–2021

Таблица 2

Средняя численность постоянно проживающего населения в г. Москве, а также прикрепленных к ЕМИАС, динамика за 2019–2021 гг.

Население (г. Москва) / Population (Moscow)		Количество человек в год / People per year, n		
		2019	2020	2021
Средняя численность постоянно проживающих / The average number of permanent residents		12 646 679	12 666 565	12 645 258
Зарегистрированные в ЕМИАС / Related to EMIAS	Всего / Total	11 927 033	12 095 161	11 879 863
	Взрослые / Adults	9 792 486	9 922 312	9 678 572
	Дети / Children	2 134 547	2 172 849	2 201 291

Table 3

Number of initial cases of patients with facial nerve disorders and morbidity among "adults and children/adolescents" in Moscow, dynamics for 2019–2021

Таблица 3

Количество первичных случаев обращения пациентов с патологией лицевого нерва и заболеваемость в возрастных категориях «взрослые и дети/подростки», динамика за 2019–2021 гг. в г. Москве

Возрастная группа / Age group	Диагноз / Diagnosis	Количество первичных случаев / Number of initial cases, n			Заболеваемость / Morbidity, n *		
		2019	2020	2021	2019	2020	2021
Взрослые / Adults	G51.0	1 519	1 281	1 465	15,5	12,9	15,1
	G51.1	58	33	28	0,6	0,3	0,3
	G51.2	7	4	5	0,1	0,0	0,1
	G51.3	116	59	64	1,2	0,6	0,7
	G51.4	65	48	65	0,7	0,5	0,7
	G51.8	806	470	525	8,2	4,7	5,4
	G51.9	536	261	315	5,5	2,6	3,3
Дети и подростки / Children and adolescents	G51.0	205	213	221	9,6	9,8	10,0
	G51.1	4	3	2	0,2	0,1	0,1
	G51.2	0	1	0	0,0	0,0	0,0
	G51.3	0	0	1	0,0	0,0	0,0
	G51.4	2	1	6	0,1	0,0	0,3
	G51.8	154	73	90	7,2	3,4	4,1
	G51.9	99	29	40	4,6	1,3	1,8

* Number of initial cases per 100,000 population.

* Количество первичных случаев на 100 000 населения.

It should be taken into account that in 2020 there was a significant decrease in the number of new cases of FNN, which is associated with a change in standard polyclinic work at the primary level in the context of the pandemic of a new coronavirus infection and self-isolation of patients. According to the graph (Fig. 1), there is a "levelling" of the situation by 2021. However, it is reasonable to consider the epidemiology of the FN disease group through 2019. Decreased patient registration may be a risk factor for worse patient recovery and the development of more complications.

The median age of adult patients with idiopathic (G51.0) and symptomatic (G51.8, G51.9) forms of FNN was 51 years (Table 4). The hypothesis of statistically significant differences in the age distribution of these groups was not confirmed (U=6532731.5, p=0.798). In cases of idiopathic FNN (diagnosis G51.0) the ratio of men and women was equal to 46 and 54% respectively, in cases of symptomatic FNN

(G51.8, G51.9) women prevailed 2 times and more (38% men, 62% women). The hypothesis that there were statistically significant differences in the distribution of these groups by sex was confirmed (χ^2=47.89, p <0.0001).

The age of patients with clonic hemifacial spasm (G51.3) was older compared with patients with facial neuropathy (63 vs 51 years). Women were significantly more predominant in this group (78% vs 22%, χ^2=54.11, p <0.001).

The age of patients with facial myokymia (G51.4) was younger compared with patients with facial neuropathy (42 vs 51 years). Female patients were also predominant (80% vs. 20%, χ^2=46.12, p <0.001).

Patients with Ramsay Hunt syndrome (G51.1) were of the same age as patients with facial neuropathy (49 vs 51 years) and were predominantly female (67 vs 33%, χ^2=8.25, p =0.005), while those with Rossolimo–Melkersson–Rosenthal syndrome (G51.2) were slightly younger (43 vs 51 years) but also predominantly female (69 vs 31%, χ^2=1.4, p=0.23).

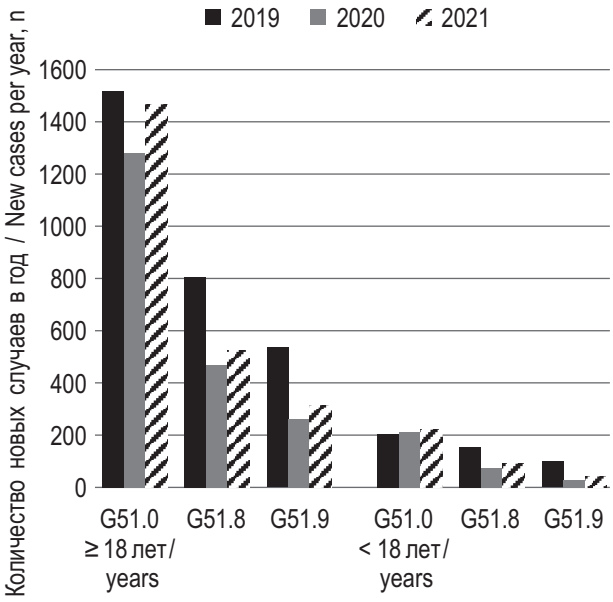

Fig. 1. Incidence dynamics of idiopathic facial paralysis (G51.0), other disorders of facial nerve (G51.8) and unspecified disorders of facial nerve (G51.9) in Moscow for 2019–2021 among the age groups "Adults" and "Children and adolescents under 18"

Рис. 1. Динамика заболеваемости идиопатической нейропатией лицевого нерва (G51.0), другими поражениями лицевого нерва (G51.8) и неуточненными поражениями лицевого нерва (G51.9) в г. Москва за период 2019–2021 гг. в возрастных группах «Взрослые» и «Дети и подростки до 18 лет»

The median age in the group of children and adolescents (less than 18 years) was 10 years, the ratio of boys and girls was 48 and 52%, respectively, and no statistically significant differences in the disease groups were found.

DISCUSSION

Knowledge of epidemiological characteristics of diseases allows not only to identify their social and economic significance and their place in the structure of general pathology of the population, but also to determine the causes and conditions of pathology development, to carry out dynamic control, to carry out prevention (including the development of complications in the event that has already occurred), to predict the need for medical care and its amount.

In the introduction of the article, a review of scientific literature with available epidemiological data on each disease was briefly presented. Firstly, the dates of publication of articles with available statistics more than 10 years ago are noteworthy. Secondly, all studies are foreign. Thirdly, the rates vary considerably. For example, the incidence of FNN varies from 8 to 32 cases per 100,000 people per year. Such an inaccuracy is inadmissible for solving the issues of organizing medical care for this category of patients and making calculations. In our study, we clarified these values, including FNN — 15.5 cases for adults and 9.6 cases for children.

The original aim of the study was to obtain and analyze epidemiological data. However, not all indicators can be obtained at present. That is why we consider it expedient to discuss the process of obtaining data and the problems we encountered, since this experience can be extrapolated to studies of other pathologies already now, and with a few changes in the technical part — to significantly expand the possibilities and supplement the data.

A detailed comparison of patients by sex, as well as the comparison of adults with children in this sample is not of scientific or practical importance. For example, women predominated among adult patients. But we cannot claim that the incidence is higher in women and operate with this fact. Perhaps women were more likely to seek medical help, since the diseases are mostly non-life threatening, but distort the face. It is of interest how to obtain exactly reliable epidemiological data in modern realities.

Table 4

Age-gender characteristics of facial nerve disorders

Таблица 4

Гендерно-возрастная характеристика заболеваний лицевого нерва

Возрастная группа / Age group	Диагноз / Diagnosis	Возраст/ Age, Me [C25; C75]	Мужчины / Males, n (%)	Женщины / Females, n (%)
Взрослые / Adults	G51.0	51.0 [36.0, 64.0]	1965 (46)	2300 (54)
	G51.1	49.0 [37.5, 61.5]	39 (33)*	80 (67)*
	G51.2	43.0 [35.0, 55.2]	5 (31)	11 (69)
	G51.3	63.0 [53.0, 71.0]	52 (22)*	187 (78)*
	G51.4	42.0 [32.0, 53.8]	36 (20)*	142 (80)*
	G51.8	51.0 [36.0, 65.0]	698 (38)*	1145 (62)*
	G51.9	50.0 [36.0, 63.0]	470 (38)*	766 (62)*
Дети и подростки / Children and adolescents	G51.0	12.0 [7.0, 15.0]	299 (47)	340 (53)
	G51.1	13.0 [10.0, 14.0]	5 (56)	4 (44)
	G51.2	10.0 [10.0, 10.0]	1	0
	G51.3	0.0 [0.0, 0.0]	1	0
	G51.4	16.0 [10.0, 16.0]	5 (56)	4 (44)
	G51.8	8.0 [3.0, 13.5]	158 (47)	181 (53)
	G51.9	9.0 [4.0, 14.0]	134 (54)	116 (46)

* Statistically significant differences were revealed in the distribution of these groups by gender in comparison with G51.0. G51.0.
* Выявлены статистически значимые различия в распределении указанных групп по полу в сравнении с G51.0.

First of all, we faced the question of what sample to calculate the data on. The morbidity rate is calculated by the number of new cases per 100,000 population. Table 2 shows that the number of the population of Moscow and the number of the population registered in the UMIAS system differ. However, about 95% of the registered population of the metropolis are registered in the electronic system. We decided to count morbidity by the number of new cases relative to all registered persons. We calculated the number of patients with the disease per 100,000 registered population.

In the estimation of epidemiological characteristics, it is necessary to take into account that some patients may have been excluded because their main diagnosis was different — trauma, otitis media, infection. In this case, the FN lesion could have been considered by the doctor, for example, as a legitimate symptom, an unwanted complication and not coded according to ICD-10. Thus, in cases of symptomatic forms of FNN (G51.8 and G51.9), it is reasonable to present the morbidity as "at least X cases per 100,000 population".

It is important that the UMIAS information system is already functioning. Currently, it is possible to track the number of visits of each patient and assess the condition at a particular visit. However, we have received a high variability of filling in unstructured fields, so it is quite labor-intensive to reliably present the causes of the disease, structure, qualitative characteristic of disease outcomes. Now it is necessary to standardize the maintenance of the attributes that are most important for doctors in terms of diagnosis and treatment of patients with facial movement disorders. Thus, at present, after receiving the UMIAS data, we can talk about trends and take measures aimed at improving the quality of information, in particular, the introduction of unified approaches to the collection, processing, storage of textual, unstructured data, which will allow us to develop standards for electronic documentation of this nosology.

In order to organize the possibility of using all fields of electronic medical records, including textual, unstructured fields, both in outpatient and inpatient facilities, it is advisable to ensure the introduction in UMIAS of a standard for filling in certain textual, unstructured fields that are important for making medical decisions, in particular for tracking the development of diseases in patients with facial movement disorders. Every year there are new possibilities

of diagnostic search, types of conservative and surgical treatment. We can notify patients about it and invite them for a treatment.

Diseases associated with FN lesions are socially important and require additional attention. It is possible to create a register of this pathology using the ICD-10 code, but the system will work only if it is registered. It is also necessary to ensure data connectivity between different medical organizations by introducing a standard for filling in certain text attributes. The standard is a kind of dictionary and algorithm depending on the stage of the disease course (prompts for filling in forms for doctors). By developing and implementing such standards, it will be possible to obtain analytical conclusions in real time (an automatic processing of database data).

CONCLUSION

For the first time, a modern analysis of the epidemiological characteristics of FN diseases (ICD-10 disease group with the code G51) for 2019–2021 is presented. It became possible because of the introduction of the UMIAS system in Moscow.

The UMIAS system opens up opportunities for obtaining epidemiological data and can be proposed as a single centralized mechanism for their collection and management. However, for making medical decisions, data from unstructured, text fields are also needed, which requires the introduction of standards for filling them in.

The development of a standard for filling in electronic medical records for the "facial nerve" profile will make it possible to create a register of patients with movement disorders in the facial area already now and to receive data from all patients in real time.

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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UDC 332.143, 614.2
DOI: 10.56871/MHCO.2024.55.22.001

SATISFACTION OF THE POPULATION OF THE REPUBLIC OF KAZAKHSTAN WITH THE ACCESSIBILITY OF MEDICAL CARE

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For citation: Begun DN, Borshchuk EL, Bulycheva EV, Omarova DS. Satisfaction of the population of the Republic of Kazakhstan with the accessibility of medical care. Medicine and Health Care Organization. 2024;9(2):70–80. DOI: https://doi.org/10.56871/MHCO.2024.55.22.001

Received: 06.05.2024 ***Revised: 14.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. Currently one of the main scientific and practical problems in the field of public health and healthcare is the availability of medical care aimed at increasing public satisfaction with medical services. At the same time "blind" optimization and decision-making management on the level of pure intuition cannot be more effective compared to scientifically based approaches to solving the problem of accessibility of medical care. In this regard relevance of studying the criteria for accessibility of medical care to the population in subjective assessments, taking into account the regional component in countries with a large territorial extent becomes obvious. The data for this study were obtained by including 1,500 people living in the northern (n=500), western (n=500) and southern (n=500) regions of the Republic of Kazakhstan. To assess the availability of medical care, a questionnaire developed by N.V. Yurgel et al. was used. The data obtained revealed the need of a systematic assessment of the availability of medical care to the population through a survey. The above analysis based on certain criteria of accessibility of medical care to the population of the Republic of Kazakhstan has shown that a differentiated approach is required in determining strategic priorities for providing health services to the population. The identified regional features of the survey data indicate the need to adapt any federal health programs to the specifics of the region, especially in countries with a large territorial extent.

KEYWORDS: accessibility of medical care, regional healthcare, the Republic of Kazakhstan

УДОВЛЕТВОРЕННОСТЬ НАСЕЛЕНИЯ РЕСПУБЛИКИ КАЗАХСТАН ДОСТУПНОСТЬЮ МЕДИЦИНСКОЙ ПОМОЩИ

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Для цитирования: Бегун Д.Н., Борщук Е.Л., Булычева Е.В., Омарова Д.С. Удовлетворенность населения Республики Казахстан доступностью медицинской помощи // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 70–80. DOI: https://doi.org/10.56871/MHCO.2024.55.22.001

Поступила: 06.05.2024 ***Одобрена: 14.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. В настоящее время одной из главных научных и практических проблем в области общественного здоровья и здравоохранения является повышение доступности медицинской помощи населению. При этом «слепая» оптимизация и интуитивное принятие управленческих

решений не могут быть эффективными. В связи с этим требуются научно обоснованные подходы, направленные на повышение доступности медицинской помощи населению. По этой причине становится очевидной актуальность изучения критериев доступности медицинской помощи населению в субъективных оценках с учетом регионального компонента в странах с большой территориальной протяженностью. Данные для настоящего исследования получены путем анализа результатов опроса 1500 человек, проживающих в северных (n=500), западных (n=500) и южных (n=500) регионах Республики Казахстан. Для оценки доступности медицинской помощи использована анкета, разработанная Н.В. Юргель и соавт. Полученные данные позволили выявить, что систематическая оценка доступности медицинской помощи населению путем опроса является необходимой. Приведенный анализ по некоторым критериям доступности медицинской помощи населению Республики Казахстан показал, что требуется дифференцированный подход в определении стратегических приоритетов обеспечения населения услугами здравоохранения. Выявленные с помощью проведенного опроса региональные особенности свидетельствуют о необходимости адаптации любых федеральных программ здравоохранения под специфику региона, особенно в странах с большой территориальной протяженностью.

КЛЮЧЕВЫЕ СЛОВА: доступность медицинской помощи, региональное здравоохранение, Республика Казахстан

INTRODUCTION

Currently, one of the main scientific and practical problems in the public health and health care is the accessibility of medical care focused on increasing the population's satisfaction with medical services [1]. Many countries seek to improve the accessibility of medical care to the population through a wide range of activities aimed at improving the integration and coordination of production and technological processes in the medical organization, improving the regulatory and legal framework. The experience of "blind" optimization and intuitive management decision-making has determined the need to use science-based approaches to solve the problem of accessibility of medical care. This requires the analysis of a number of parameters that allow for the detailed elaboration of tasks, measures and resulting indicators within the framework of the overall problem. In this regard, the relevance of studying the criteria of accessibility of medical care to the population becomes obvious.

AIM

The aim is to assess the availability of medical care to the population living in the regions of the Republic of Kazakhstan.

MATERIALS AND METHODS

The data for this study were obtained by analyzing the results of a survey of 1,500 people living in the northern (n=500), western (n=500) and southern (n=500) regions of the Republic of Kazakhstan. The questionnaire developed by N.V. Yurgel et al. was used for this purpose [2]. The questionnaire included blocks that allowed to assess the possibility of free choice of medical organization and doctor, availability of specialist doctors, possibility to pay for medical services, satisfaction with the conditions and results of medical care, awareness of various issues, the main reasons for seeking medical care, reasons for refusal, complaints about various aspects of medical care.

The survey was conducted in strict compliance with the rules based on standard sociological practices, as well as in accordance with the clear fulfilment of sampling requirements. Determination of the sample size for conducting the survey in the regions of the Republic of Kazakhstan was carried out according to the tabular method of K.A. Otdelnova [3]. The minimum sample size for studies of increased accuracy at the planned level of statistical significance p=0.05 should be 400 people according to that method. The sample size of 500 people for each group was taken taking into account the possibility of receiving incomplete or incorrect answers.

Statistical analysis of the obtained data was carried out by calculating relative values: intensive and extensive indicators. The level of statistical significance of differences between groups was determined using Pearson's $\chi 2$ criterion. Differences were considered statistically significant at $p < 0.05$.

RESULTS AND DISCUSSION

The analysis of the study showed that in 60.6% of cases residents of the Republic of Kazakhstan got medical care in polyclinics. There were statistically significant differences (p <0.001) in the frequency of treatment depending on the place of residence. Thus, residents of the southern regions (99.8%) applied for medical help to polyclinics as often as possible, and almost the same number of respondents from the same region (98%) applied to private medical organizations. This fact can probably be related to the fact that, having failed to receive timely assistance in state medical organizations, the population of the southern regions had to turn to private medical organizations. At the same time, the population's turnover to private medical organizations in the western and northern regions of the Republic of Kazakhstan was only 10.4–15.4%. The maximum number of people who practiced self-treatment was also recorded in the southern regions (19.8%), which is 9.9–14.2 times higher than in the northern and western regions (Fig. 1).

Every third resident of the Republic of Kazakhstan needed consultative (39.5%) and therapeutic and diagnostic (35.5%) medical care. At the same time, the maximum number of the population in need of counselling was found in the southern regions (58.8%). Here and additionally in the western regions, 41% of the population also needed therapeutic and diagnostic medical care. It is noteworthy that in the southern regions only 0.2% of the population needed preventive care, whereas in the northern and western regions the number of residents with such a request for medical care was 42.8 and 31.8%, respectively (Table 1). The revealed

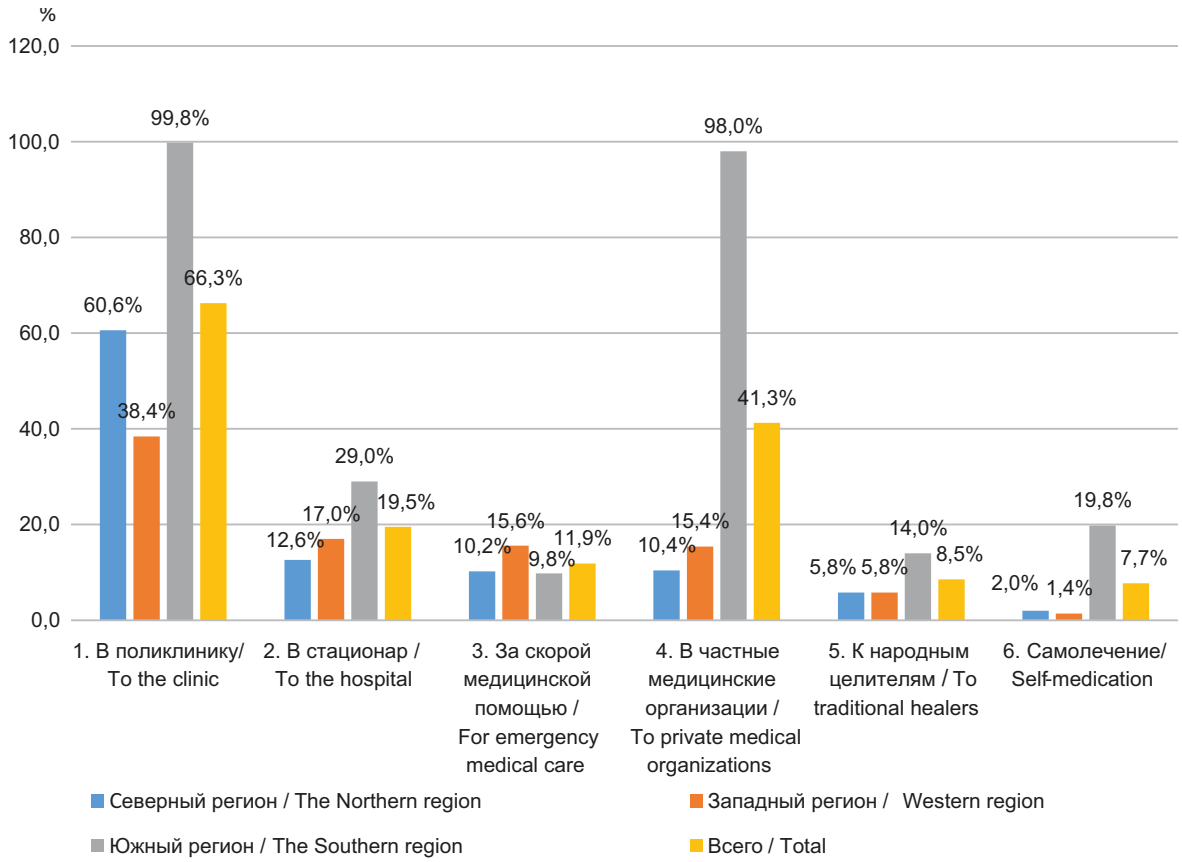

Fig. 1. Distribution of respondents taking into account the need for medical care. 1 — χ^2 Pearson = 432,4, cc=2, p <0,001; 2 — χ^2 Pearson = 45,8, cc=2, p <0,001; 3 — χ^2 Pearson = 10,0, cc=2, p <0,05; 4 — χ^2 Pearson = 998,6, cc=2, p <0,001; 5 — χ^2 Pearson = 28,7, cc=2, p <0,001; 6 — χ^2 Pearson = 153,2, cc=2, p <0,001

Рис. 1. Распределение респондентов с учетом обращаемости за медицинской помощью. 1 — χ^2 Пирсона = 432,4, cc=2, p <0,001; 2 — χ^2 Пирсона = 45,8, cc=2, p <0,001; 3 — χ^2 Пирсона = 10,0, cc=2, p <0,05; 4 — χ^2 Пирсона = 998,6, cc=2, p <0,001; 5 — χ^2 Пирсона = 28,7, cc=2, p <0,001; 6 — χ^2 Пирсона = 153,2, cc=2, p <0,001

Table 1

Distribution of the population, taking into account the purpose of seeking medical care (%)

Таблица 1

Распределение населения с учетом цели обращения за медицинской помощью (%)

Контингент населения / The population contingent	Цель обращения / The purpose of the appeal		
	профилактическая / preventive	консультативная / advisory	лечебно-диагностическая / medical and diagnostic
Все регионы / All regions	24,9	39,5	35,5
Северные регионы / Northern regions	42,8	32,6	24,6
Западные регионы / Western regions	31,8	27,2	41,0
Южные регионы / Southern regions	0,2	58,8	41,0

Note: χ^2 Pearson = 293.6, cc=4, p <0.001.
Примечание: χ^2 Пирсона = 293,6, cc=4, p <0,001.

differences are statistically significant (Pearson's χ^2=293.6, SS=4, p <0.001).

Endocrine system diseases (15.3%) were in the first place in the frequency of the causes of visits among citizens of the Republic of Kazakhstan, and in the last place — diseases of musculoskeletal system and connective tissue (6.6%) and diseases of nervous system (6.6%) (Table 2). At the same time the frequency of the reasons of population's appeals with regard to the region of residence differed (p <0.05). Thus, the first place in the northern regions of the Republic of Kazakhstan was occupied by endocrine system diseases, and the last place was occupied by eye diseases (3.4%). In the southern regions, the first place was taken by eye diseases (19.8%), and the last place was taken by diseases of the musculoskeletal system and connective tissue (0.2%). Based on the peculiarities of the frequency of population turnover, it becomes obvious, whether the region requires strengthening of medical care in the required profile.

In addition to the picture of the availability of medical care to the population, along with the frequency of reasons for the population's appeal presented above, there are survey data on the lack of specialists in the regions (Fig. 2).

Thus, according to the residents of the Republic of Kazakhstan, there is the least shortage of otorhinolaryngologists (5.7%), and the most lack of ophthalmologists. Most often residents noted the shortage of ophthalmologists (21.6%) and district therapists (22.2%) in the northern regions; endocrinologists (20.4%) in the western regions and the shortage of dentists (29.8%) and endocrinologists (28.8%) in the southern regions.

The results of analyzing the comparison of the frequency of reasons for treatment and shortage of specialists within one region became interesting. Thus, the maximum frequency of treatment due to endocrine system diseases in the northern region (17.6%) revealed the minimum share of population answers that there is a shortage of endocrinologists in the region (4.8%), which may indirectly indicate that there is sufficient staffing in this profile in this region. Another situation was also revealed when comparing the frequency of the reasons for treatment for eye diseases, which was minimal (3.4%), with every fifth resident of the northern regions noting a shortage of ophthalmologists. It becomes obvious that the low rate of seeking medical help to an ophthalmologist is probably caused not by the lack of complaints about this nosology in the population, but by the lack of a specialist to whom one can address these complaints. This assumption can also be confirmed by the fact that in the same region up to 72.4% of respondents noted that they had been refused examination and treatment, which can probably be related to the lack of specialists or necessary equipment for examination. In the western regions, up to 59.8% of respondents were also refused examination and treatment, and only in the southern regions only 9.2% of cases were refused.

Table 2

The frequency of the population seeking medical care, taking into account the reasons for treatment (%)

Таблица 2

Частота обращаемости населения за медицинской помощью с учетом причин обращения (%)

Причина обращения / The reason for the appeal	Регионы / Regions			
	все / all	северный / northern	западный / western	южный / southern
Болезни органов кровообращения / Diseases of the circulatory system	8,5	10,6	10	4,8
Болезни органов дыхания / Respiratory diseases	8,8	13,6	11	1,8
Болезни костно-мышечной системы и соединительной ткани / Diseases of the musculoskeletal system and connective tissue	6,6	5,8	13,8	0,2
Болезни мочеполовой системы / Diseases of the genitourinary system	7,3	8,4	8,6	4,8
Болезни эндокринной системы / Diseases of the endocrine system	15,3	17,6	10,4	18,0
Болезни нервной системы / Diseases of the nervous system	6,6	8,0	9,8	2,0
Болезни глаза / Eye diseases	10,5	3,4	8,4	19,8

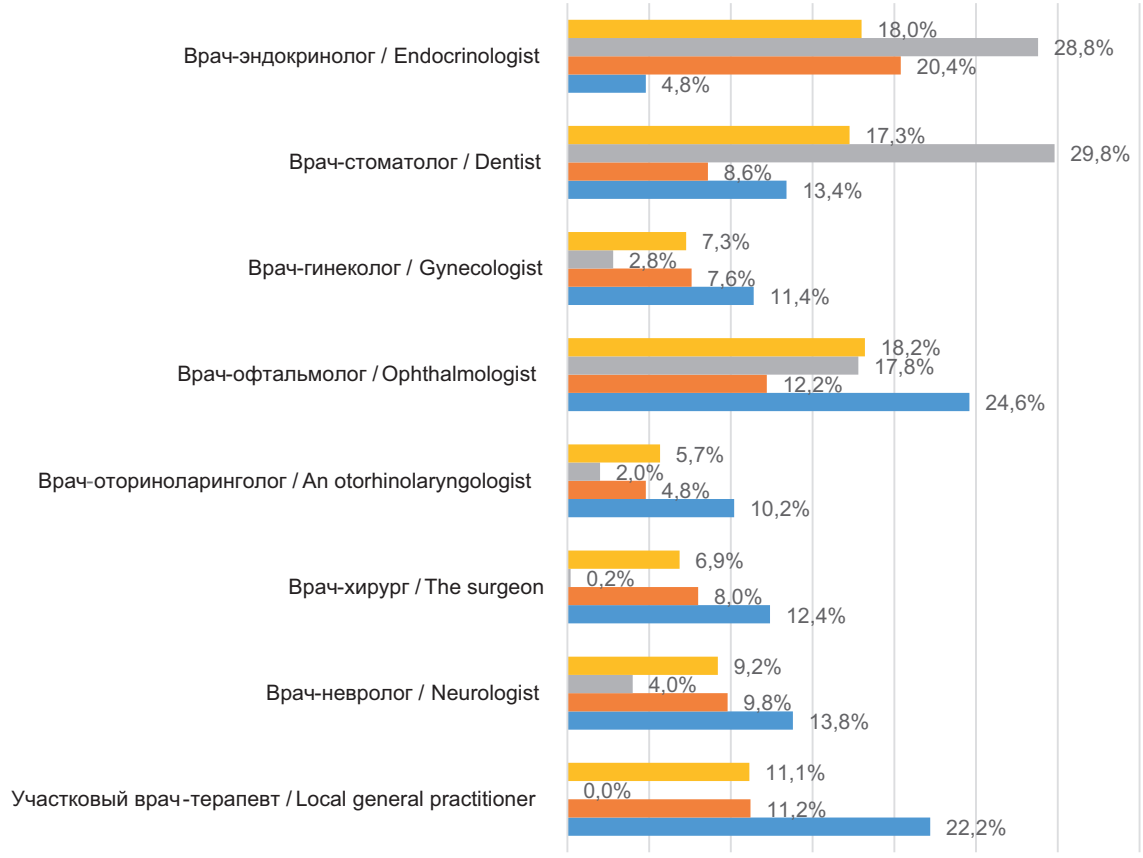

Fig. 2. Survey data on the fact of the absence of specialized specialists in medical organizations

Рис. 2. Данные опроса о факте отсутствия профильных специалистов в медицинских организациях

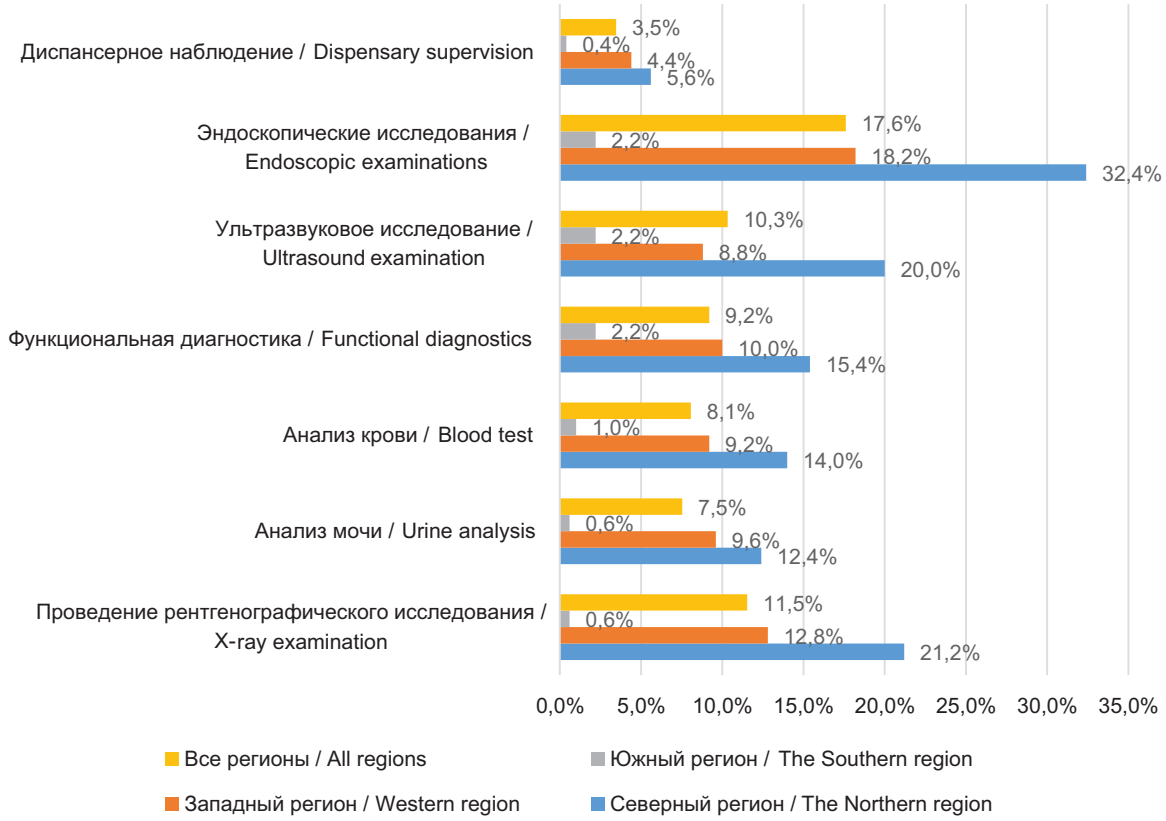

Fig. 3. Refusals to the population in various types of medical care

Рис. 3. Отказы населению в различных видах медицинской помощи

Refusal to examine the population can be associated with different reasons (Fig. 3). Thus, the population of the studied regions was most often denied endoscopic examinations (17.6%), and the least often denied medical follow-up. The frequency of refusals in medical care was the highest among the population of the northern regions of the Republic of Kazakhstan, and the lowest among the population of the southern regions.

Analyzing the survey data on the terms of planned hospitalization, it was found that only 26.5% of the surveyed residents of the Republic of Kazakhstan noted the absence of a waiting list, while the terms of planned hospitalization exceeding 7 days and more were noted in 0.6–10.0% of cases. The minimum frequency of waiting times of 7 days and more was noted by the population of the southern regions (0.4%). In the western regions the frequency of waiting for planned hospitalization from 7 to 14 days was 14.5%, up to 4 weeks it was 10.0%. In the northern regions, the frequency of planned hospitalization within these periods was lower by 1.8 and 3.3 times, respectively.

Taking into account the recommended duration of reception of one patient for different specialists, which ranges from 10 to 22 minutes, the waiting time for a doctor's appointment in the queue should also be within these limits. However, it has been established that this chronological regulation is not always observed (Table 3).

The frequency of answers about waiting for a district therapist for up to 15 minutes was revealed only for every second respondent. At the same time, every fifth resident of the Republic of Kazakhstan waited from 15 to 30 minutes to visit a doctor. No significant differences were revealed taking into account the region of residence.

A neurologist, according to the recommended norms, has up to 22 minutes for examination of one patient. At the same time, every fifth resident waited from 30 minutes to 1 hour for an appointment. The maximum number of residents (40.2%) who waited more than 30 minutes for a doctor's appointment lived in the southern regions, while in other regions the percentage of residents with such problems was 13.4–20.6%.

Table 3

Waiting time in the queue of a specialist doctor by the population (%)

Таблица 3

Время ожидания в очереди врача-специалиста населением (%)

Врач и контингент респондентов / The doctor and the contingent of respondents	Время ожидания в очереди / Waiting time in the queue				
	до 15 мин / up to 15 minutes	до 30 мин / up to 30 minutes	до 1 ч / up to 1 hour	до 2 ч / up to 2 hours	более 2 ч / more than 2 hours
1. Участковый врач-терапевт / Local general practitioner					
Все регионы / All regions	55,2	26,0	14,6	3,8	0,5
Северный регион / The Northern region	55,2	22,0	15,2	7,0	0,6
Западный регион / Western region	61,4	21,8	11,6	4,4	0,8
Южный регион / The Southern region	48,9	34,1	17,0	0,0	0,0
2. Врач-невролог / Neurologist					
Все регионы / All regions	25,8	52,4	19,2	2,3	0,2
Северный регион / The Northern region	25,7	51,2	20,6	2,1	0,4
Западный регион / Western region	25,1	58,4	13,4	3,0	3,0
Южный регион / The Southern region	29,9	29,9	40,2	0,0	0,0
3. Врач-хирург / The surgeon					
Все регионы / All regions	28,0	42,5	27,0	2,3	0,3
Северный регион / The Northern region	24,8	45,4	25,9	3,2	0,6
Западный регион / Western region	32,8	39,4	26,1	1,7	0,0
Южный регион / The Southern region	14,3	42,9	42,9	0,0	0,3
4. Врач-оториноларинголог / An otorhinolaryngologist					
Все регионы / All regions	30,7	42,6	23,4	3,2	0,2
Северный регион / The Northern region	28,3	42,7	25,9	2,8	0,2
Западный регион / Western region	32,2	42,2	21,2	4,2	0,2
Южный регион / The Southern region	34,7	43,9	21,4	0,0	0,0
5. Врач-офтальмолог / Ophthalmologist					
Все регионы / All regions	31,9	43,6	20,5	2,2	1,7
Северный регион / The Northern region	24,5	45,5	26,2	1,7	2,2
Западный регион / Western region	36,7	39,0	19,1	3,4	1,8
Южный регион / The Southern region	42,5	52,8	4,7	0,0	0,0
6. Врач-гинеколог / Gynecologist					
Все регионы / All regions	26,8	43,0	27,2	1,8	1,3
Северный регион / The Northern region	21,6	45,1	29,9	2,2	1,3
Западный регион / Western region	37,2	39,7	19,9	1,8	1,4
Южный регион / The Southern region	8,5	46,6	44,1	0,0	0,9

Ending of the Table 3 / Окончание табл. 3

Врач и контингент респондентов / The doctor and the contingent of respondents	Время ожидания в очереди / Waiting time in the queue				
	до 15 мин / up to 15 minutes	до 30 мин / up to 30 minutes	до 1 ч / up to 1 hour	до 2 ч / up to 2 hours	более 2 ч / more than 2 hours
7. Врач-стоматолог / Dentist					
Все регионы / All regions	41,9	37,7	17,5	2,8	0,1
Северный регион / The Northern region	26,5	47,3	23,2	3,0	0,0
Западный регион / Western region	45,6	32,3	18,5	3,4	0,2
Южный регион / The Southern region	73,2	25,7	0,6	0,6	0,0

Taking into account that it is recommended to spend 26 minutes for a surgeon to see one patient, only 42.5% of the population of the Republic of Kazakhstan noted that they managed to get an appointment with this specialist within 30 minutes. 27% of respondents noted that the waiting time was from 30 minutes to 1 hour. The greatest number of residents waiting for a doctor's appointment for more than 30 minutes was also found in the southern regions.

In all regions there was almost the same number of respondents (from 21.1 to 25.9%) who noted that they waited for an otorhinolaryngologist's appointment for 30 minutes or longer, while the recommended standard is only 16 minutes.

Every third respondent waited 30 minutes or longer for an appointment with a gynecologist, while the recommended appointment time was 22 minutes. The maximum number of people who noted such waiting time was in the southern regions (45.0%), while in the western and northern regions the proportion of people who noted such waiting time was 23.1 and 33.4%, respectively.

The majority of respondents reported waiting times for dentists of up to 15 minutes and up to 30 minutes — from 37.7 to 41.9%. At the same time, no significant differences were found in the answers of respondents taking into account their place of residence.

The above comparison of the recommended norms of admission and the actual waiting time for appointments to various specialists revealed the directions among which doctors and in which regions this process needs to be regulated.

In addition to the fact that accessibility of medical care may be limited by long waiting times for appointments, another significant factor in reducing accessibility may be the convenience of appointment schedules for the working population. Every third respondent noted the inconvenience of doctors' appointment schedules, with the maximum number of respondents indicating this fact in the western (47.6%) and northern (47.0%) regions.

The reasons for the inconvenience of doctors' appointment schedules for residents of the Republic of Kazakhstan in 36.4% of cases was the lack of opportunity to get an appointment before 15:00. In 33.4% of cases it was the lack of opportunity to get an appointment with a doctor on a weekend day. In 30.2% of cases it was the inconsistency of the doctor's appointment schedule with the working hours of the respondent. At the same time, the main and the only reason for the inconvenience of the doctor's appointment schedule in the southern regions was considered by the population to be the discrepancy between the doctor's schedule and their working hours (100%). In the northern regions, the leading reason for the inconvenience of the doctor's appointment schedule was considered by the population to be the inability to get an appointment before 15:00 (45.2%). In the western regions, the leading reason was the inability to get an appointment with a doctor at weekends (41.4%).

According to 39.4% of respondents, the decrease in the accessibility of medical care is associated with the increase in the volume of paid medical care. In the presented illustration (Fig. 4) about negative phenomena, the data of answers of the population of southern regions especially stand out, among which the maximum frequency was recorded for such criteria as increase in the volume of paid medical services (47.6%), high cost of medicines (44.0%), long queues for appointments (29.8%), decrease in the quality of service (22.6%) and poor equipment (20.6%) of medical institutions.

The above analysis of some criteria of accessibility of medical care to the population of the Republic of Kazakhstan has shown that a differentiated

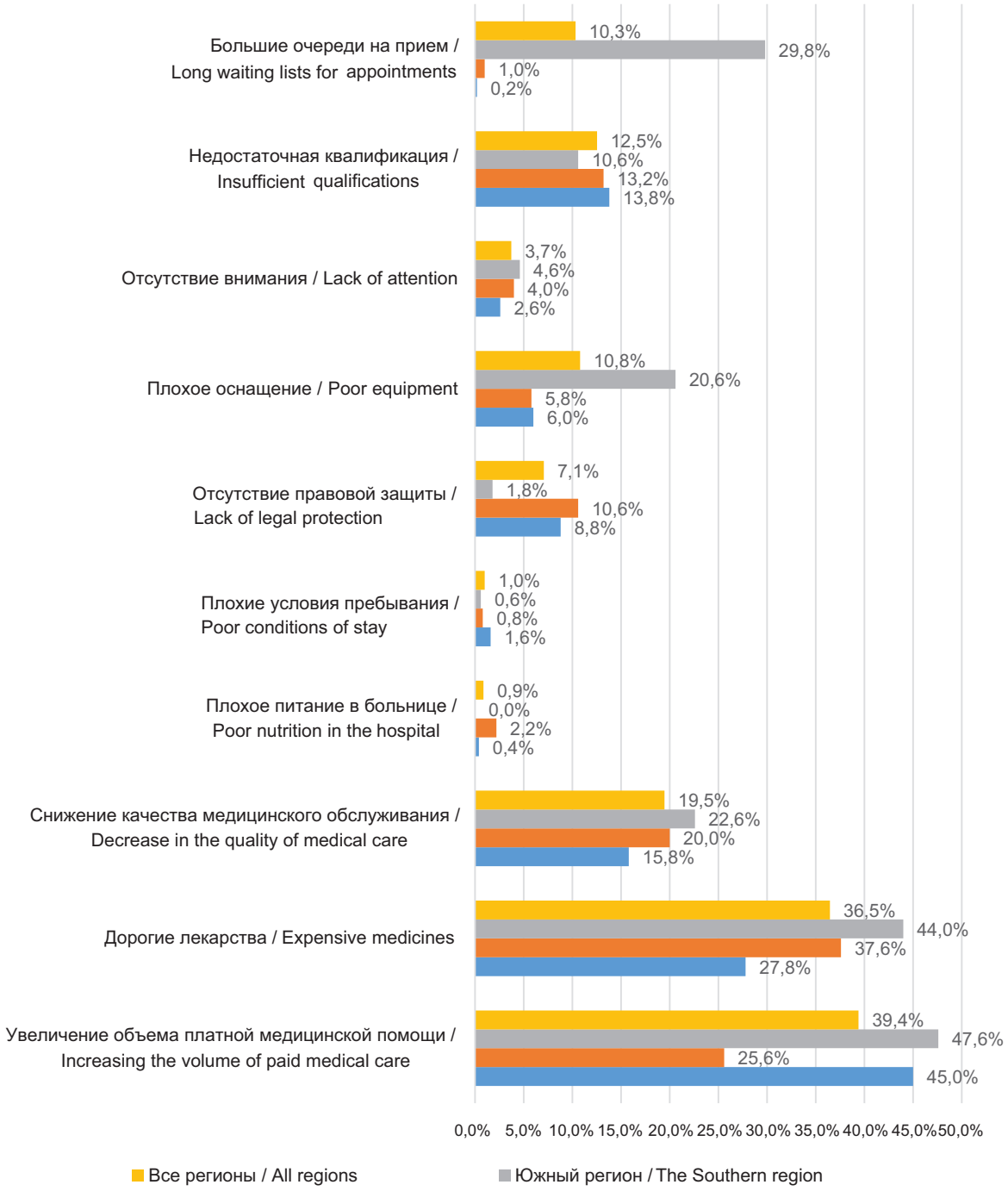

Fig. 4. The frequency of negative phenomena that reduce the availability of medical care

Рис. 4. Частота негативных явлений, снижающих доступность медицинской помощи

approach is required in determining the strategic priorities of providing the population with health care services [4]. This becomes extremely relevant, as the Ministry of Health of the Republic of Kazakhstan continuously and systematically works to improve the accessibility of medical care provided to the population to reduce complaints of the population about medical personnel [5].

The established facts of high frequency of answers of the surveyed population, taking into account the region of residence, about the increase in the volume of paid medical services, shortage of specialists, increased waiting time for appointments, refusals to provide medical care, and insufficient equipment are also compared with other studies and experience of im-

proving the accessibility of medical care in other countries. Thus, in the Russian Federation in Article 10 of the Federal Law No. 323-FL dated 21.11.2011 the legislator presents the criteria of accessibility of medical care [6]. S.N. Shelepov [7] notes, the above list of criteria can be extrapolated to health care services in general, but with the following additions: sufficient drug supply to the population; medical interventions and manipulations with the use of medical technologies in medical organizations in accordance with safety requirements; provision of health care services by medical specialists. During the process of providing health care services, the specificity lies in the fact that citizens who apply to the relevant organizations for their receipt are often unable to wait, unable to assert their rights to receive this or that volume of these services, unable to pay for expensive services, but nevertheless expect the necessary (not minimum) volume and range of services. In many countries, the progressive process of replacing free health care with paid services should be recognized as significant problems compromising equal and fair access of citizens to health care services [7]. At the same time, it is difficult to ignore the increase in the proportion of respondents who apply to private clinics and medical centers, while the share of those who in their choice is limited exclusively to commercial organizations is insignificant — residents of the region are more likely to vary situationally between organizations of both types of ownership [8].

The analysis of statistical data shows that there is no shortage of equipment and personnel (except for endocrinologists) in medical organizations of the regions under study. The presence of dissatisfaction of the population of the regions of the Republic of Kazakhstan with the availability of medical care according to the above-mentioned indicators against the background of the absence of problems in staffing and equipment is probably due to the imperfection of the organization of medical care on the ground and requires further study to develop management solutions for its improvement.

CONCLUSION

The results of the sociological survey on the satisfaction of the population of the Republic of Kazakhstan with the accessibility of medical care indicate the need to find out the reasons for its decline in some criteria and to improve the existing organization of medical care. In the southern regions, increasing the population's satisfaction with the accessibility of medical care should be achieved by increasing the number of staff in the profiles of "endocrinology" and "dentistry", expanding the opportunities for the population to be examined by endoscopic and ultrasound examinations, reducing the waiting time for appointments with neurologists, surgeons, otorhinolaryngologists and gynecologists, as well as by reducing the burden of financial expenditure on paid medical services and medicines. In the northern regions, it is necessary to increase the availability of endocrinological medical care, improve the organization of work of ophthalmologists and district general practitioners, and expand the opportunities to examine the population through endoscopic examinations. In the western regions, increasing the population's satisfaction with the accessibility of medical care requires improving medical care to the population in cases of musculoskeletal pain, increasing the accessibility of medical care in the endocrinological profile, increasing the number of otorhinolaryngologists in medical organizations, and expanding the opportunities for examining the population through endoscopic research.

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. The authors received written consent from the respondents to publish the data.

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 анкетируемых на публикацию данных.

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UDC 001.891.53+614.254+616-092+378-057+623.454.862
DOI: 10.56871/MHCO.2024.94.39.008

PREFERENCES OF MEDICAL STUDENTS IN SOURCES OF INFORMATION ON RADIATION SAFETY ISSUES

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For citation: Biblin AM, Vodovatov AV, Kapyrina YuN, Imamov AA, Puzyrev VG, Orel VI, Moiseeva KE, Guseva RA. Preferences of medical students in sources of information on radiation safety issues. Medicine and Health Care Organization. 2024;9(2):81–91. DOI: https://doi.org/10.56871/MHCO.2024.94.39.008

Received: 13.05.2024 ***Revised: 14.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. Sources of ionizing radiation are increasingly used in modern healthcare for diagnostic and therapeutic purposes. They can pose a hazard to both patients and medical practitioners if sanitary regulations are not met and safety culture is poor. Competencies in the field of radiation impact on humans and the environment, ensuring radiation safety are being set in the process of higher education. The study of students' information preferences allows to develop measures to improve the efficiency of the educational process and, as a result, to increase the competence of students in the issues of radiation safety of patients and the population as a whole. The aim of this work was to identify effective ways to improve information work on radiation safety issues for the students of a medical university. The study was carried out on the basis of St. Petersburg State Pediatric Medical University. A total of 301 people were interviewed. The study revealed a high level of students' interest in radiation issues. In the content structure of students' information requests on radiation issues four leading semantic components are distinguished: "radiation protection measures available at the place of residence", "the trends in the change of the radiation situation", "radiation effect on health", as well as "dangerous and safe levels of radiation". Internet and SMS-alerting were the leading ways of receiving information. Among all the sources of information, according to the students' opinion, EMERCOM, Rospotrebnadzor and specialists/scientists are the most trusted in radiation safety issues among the population. The overwhelming majority of respondents are in favor of providing the population with complete and reliable information in case of a radiation accident.

KEYWORDS: students, sociological survey, radiation protection, information work, ionizing radiation, radiation accident

ПРЕДПОЧТЕНИЯ СТУДЕНТОВ МЕДИЦИНСКИХ ВУЗОВ В ИСТОЧНИКАХ ПОЛУЧЕНИЯ ИНФОРМАЦИИ ПО ВОПРОСАМ РАДИАЦИОННОЙ БЕЗОПАСНОСТИ

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Для цитирования: Библин А.М., Водоватов А.В., Капырина Ю.Н., Имамов А.А., Пузырев В.Г., Орел В.И., Моисеева К.Е., Гусева Р.А. Предпочтения студентов медицинских вузов в источниках получения информации по вопросам радиационной безопасности // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 81–91. DOI: https://doi.org/10.56871/MHCO.2024.94.39.008

Поступила: 13.05.2024 ***Одобрена: 14.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. Источники ионизирующего излучения находят все более широкое применение в современном здравоохранении в диагностических и терапевтических целях. При несоблюдении требований санитарного законодательства и низкой культуре безопасности они могут представлять опасность как для пациентов, так и для медицинского персонала. Компетенции в области радиационного воздействия на человека и окружающую среду, обеспечения радиационной безопасности закладываются будущим специалистам в процессе обучения в высших учебных заведениях. Исследование информационных предпочтений студентов позволяет разработать меры по повышению эффективности образовательного процесса и в итоге повысить компетенции обучающихся в вопросах радиационной безопасности пациентов и населения в целом. Цель данной работы заключалась в определении путей совершенствования информационной работы по вопросам радиационной безопасности со студентами медицинского вуза. Исследование выполнено на базе Санкт-Петербургского государственного педиатрического медицинского университета. Всего был опрошен 301 человек. Выявлен высокий уровень интереса студентов к радиационной тематике. В тематической структуре современных информационных запросов студентов по радиационной проблематике выделяются четыре ведущих смысловых компонента: «меры защиты от радиации, доступные по месту жительства», «как будет меняться радиационная обстановка», «действие радиации на здоровье», а также «опасные и безопасные уровни радиации». Ведущими способами получения информации стали Интернет и СМС-оповещение. Среди всех источников информации наибольшим доверием в вопросах радиационной безопасности у населения, по мнению студентов, пользуются МЧС, Роспотребнадзор и специалисты/ученые. Подавляющее большинство респондентов выступают за предоставление населению полной и достоверной информации в случае радиационной аварии.

КЛЮЧЕВЫЕ СЛОВА: студенты, социологическое исследование, радиационная безопасность, информационная работа, ионизирующее излучение, радиационная авария

INTRODUCTION

Sources of ionizing radiation (SIR) are increasingly used in modern healthcare for both diagnostic and therapeutic purposes [1–3]. Ongoing work is being done to introduce new methods of radiation diagnostics and therapy into practice. Such widespread use of SIR, along with undeniable benefits for patients, is associated with risks of adverse effects on health of both patients and health workers. Risk factors in this case are non-compliance with the requirements of sanitary legislation in the field of radiation hygiene and poor safety culture [4, 5]. The use of SIR makes high demands to competencies of medical personnel to ensure radiation safety of patients and to be aware of the possible risks of SIR exposure for health.

Basic training of medical specialists and instilling the safety culture is carried out in the course of higher education. Competencies in the radiation impact on humans and the environment, as well as in ensuring radiation protection in graduates of medical universities are formed throughout all years of study [6, 7]. The radiation safety of patients largely depends on the quality of training of young specialists. One of the main tasks of training in the departments of radiation diagnostics and radiation hygiene is to develop competencies

in radiation protection for future doctors. This is especially relevant for those who use medical SIR and/or refer patients for X-ray examinations. However, not all scenarios of use ionizing radiation in medicine may be addressed in the specialized training cycles. In addition, it is important that studies within the several years after the Chernobyl accident shows that physicians are one of the most authoritative categories of people. The population believes that the behavior of doctors is a role model [8]. Experience in eliminating the consequences of the Chernobyl accident has demonstrated that medical workers are able to increase the effectiveness of protective measures aimed at reducing radiation doses and radiation anxiety of the population.

The level of training of specialists in radiation safety issues plays a special role in a separate type of X-ray examinations (interventional radiology). Doses of radiation during X-ray and its exposure on patients and personnel are largely determined by health workers' qualification. Particular attention is paid to the level of knowledge about the effects of ionizing radiation on human body and practical methods of ensuring radiation safety [5, 9].

A young specialist will turn to available sources of information to obtain the necessary knowledge. There is need to critically evaluate accessible sources of information on radiation safety in view of adequacy, credibility and usability. Studies to identify trusted sources and preferred means of information dissemination are mandatory when developing programs for information work with the population on radiation safety issues [10, 11]. Research of students' information preferences allows to develop measures to improve the efficiency of the educational process. As a result, this will lead to an increase in students' competencies in the issues of radiation safety of patients and the population as a whole.

AIM

The aim of this work was to identify ways to improve information work on radiation safety issues for the students of a medical university.

The following main tasks to achieve this goal were set:

- to study the information needs of students on radiation safety;
- to identify the students' preferred ways of receiving information on radiation safety issues;
- to determine the students' degree of confidence in the sources of information on radi-ation safety;
- to identify the students' preferred methods of increasing environmental literacy of the population.

MATERIALS AND METHODS

The study was carried out on the basis of St. Petersburg State Pediatric Medical University (SPbSPMU). The survey was conducted from September 2023 to March 2024. A total of 301 people were interviewed. The respondents were students of St. Petersburg State Pediatric Medical University. The questionnaires were filled out in the Google Forms[1] service.

Sample characteristics are presented in Table 1.

The questionnaire consisted of 27 questions. Separate blocks of questions were devoted to the information needs of interviewees on radiation safety issues, preferred ways of receiving such information and trust in it.

The results of this study were compared with the results of a research of the opinions of fifth-year students of the Faculty of Preventive Medicine of the North-Western State Medical University named after I.I. Mechnikov (NWSMU). The latter was conducted in 2019 by the authors in the form of an in-person survey. A total of 123 people were interviewed. Among those who responded to the questionnaire, 20.3% were men and 79.7% were women [12].

The study materials were subjected to statistical analysis using parametric and non-parametric methods. Collection, correction, systematization of initial information and visualization of the obtained results were carried out in Microsoft Office Excel 2016 spreadsheets. Statistical analysis was conducted using the STATISTICA 12 program.

The normal distribution of the quantitative data sets was tested using the Kolmogorov–Smirnov test. The normality test refuted the hypothesis of normal distribution of responses to all questions considered in the article. Nominal data were described with absolute values and percentages. Comparison of the measurement results of different subgroups in samples on ordinal scales was made using the Kolmogorov–

[1] https://docs.google.com/forms/d/12Trgyo6BHkYTkoBULC-esTGyo0nGhbIKK-i884m3tb4.

Table 1

Characteristics of the samples

Таблица 1

Характеристика выборки

Пол,% / Sex,%					
Мужской / Male			Женский / Female		
13			87		
Возраст, лет / Age, years					
Минимум /Minimum		Среднее / Average		Максимум / Maximum	
17		20,4		44	
Курс,% / Year of study,%					
1	2	3	4	5	6*
15	14	26	20	16	9
Специальность,% / Specialty,%					
Педиатрия / Pediatrics	Лечебное дело / Medicine	Медико-профилактическое дело / Preventive medicine		Стоматология / Stomatology	Прочее / Other
45,7	18	19,3		8,3	8,7

Smirnov Z-test. Differences between samples were considered significant at $p < 0.05$.

RESULTS AND DISCUSSION

Figure 1 shows the distribution of answers to the question on respondents' interest in the information about radiation situation in the region and locality of residence.

The distribution of answers to this question in both universities is identical. Such information is in demand by 80% of interviewees. However, the majority does not see the need for this information in a normal situation. They believe that access to such information should be possible when necessary.

Figure 2 presents the distribution of answers to the question on what information about radiation and radiation safety respondents would like to know first. The samples of students from two universities differ significantly in the choice of answer options: "protection measures" ($p=0.006$), "hazardous and safe radiation levels" ($p=0.007$), "how the radiation situation will change" ($p < 0.001$). Students of SPbSPMU showed greater interest in these topics than students of NWSMU.

In the content structure of students' information requests on radiation issues, four leading semantic components are distinguished, each of which was of interest to more than 50% of interviewees at SPbSPMU: "radiation protection measures available at the place of residence", "the trends in the change of the radiation situation", "radiation effect on health", as well as "dangerous and safe levels of radiation". A small number of respondents demonstrated lack of interest in information on radiation.

It should be noted that all these issues in one form or another are included in the educational programs for training students of medical faculties.

The distribution of respondents' preferences regarding sources of dissemination of information on radiation situation in their place of residence is presented in Figure 3. The samples differ significantly in the response option "SMS notification" ($p=0.04$). Students of SPbSPMU showed greater interest in this type of information.

As expected, the leading way of receiving information, especially given the demographic characteristics of the respondents, was the Internet. This answer option was chosen by 95.7% of interviewees at SPbSPMU. The high interest in SMS-alerting indicates that a significant part of the population is waiting for precisely the operational information on radiation situation, dangerous situations and accidents. Only a third of respondents indicated TV. The students' choice of specialists' lectures as a preferred source may be associated with an established habit of receiving information in this format. Traditional ways of getting information, such as radio and newspapers, were not of interest to interviewees.

Figure 4 shows the parameters of public trust in various sources of information on radiation conditions and safety, according to respondents. The samples differ significantly in the answers: “information on the Internet” ($p < 0.01$) and “Roshydromet” ($p < 0.001$). The answer option “medical practitioners” in the survey of students of NWSMU was absent.

Among all sources of information, EMERCOM was the undisputed leader in terms of public trust, according to students at both universities. Rospotrebnadzor and specialists/scientists (as a generalized category) demonstrated high levels of trust., According to interviewees of SPbSPMU, more than 50% of residents of St. Petersburg and the Leningrad Region trust them on radiation issues.

Table 2 presents the results of responses to the question about the right of authorities to restrict access to information about an accident at

Fig. 1. Interest in the information about radiation situation (%)

Рис. 1. Интерес к сведениям о радиационной обстановке (%)

Fig. 2. Information needs on radiation safety issues (%)

Рис. 2. Информационные запросы по вопросам радиационной безопасности (% от общего числа опрошенных, возможно несколько вариантов ответа)

a radiation-hazardous facility. Statistically significant differences in the answers of students from the two universities to the question about restricting access to such information were not identified.

As can be seen, the overwhelming majority of respondents in both universities are in favor of providing the population with complete and reliable information in case of a radiation accident.

Statistically significant differences in the responses of students from the two universities to the question about the most effective methods

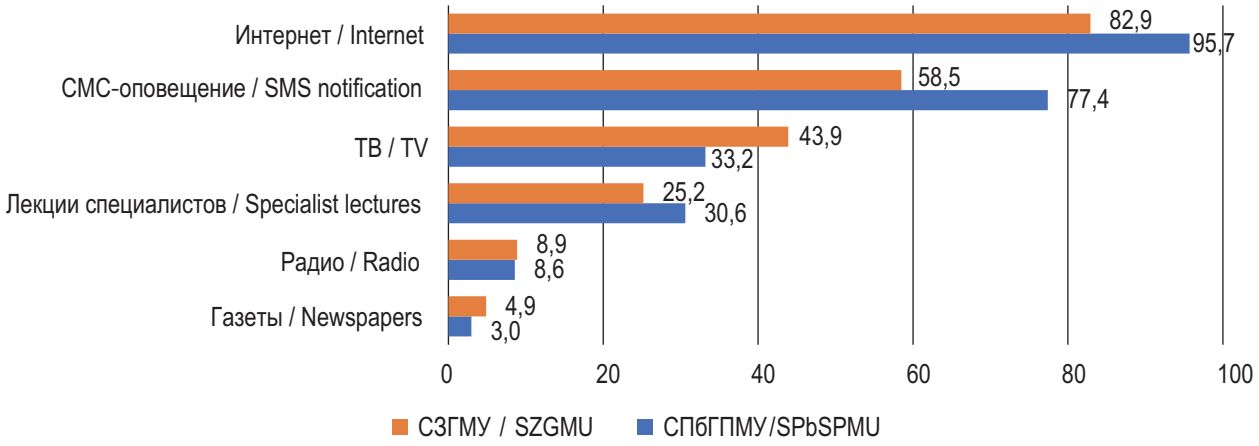

Fig. 3. Percentage of the most preferred sources of information on radiation situation in the region (%)

Рис. 3. Удельный вес наиболее предпочтительных источников получения информации о радиационной обстановке в регионе (%)

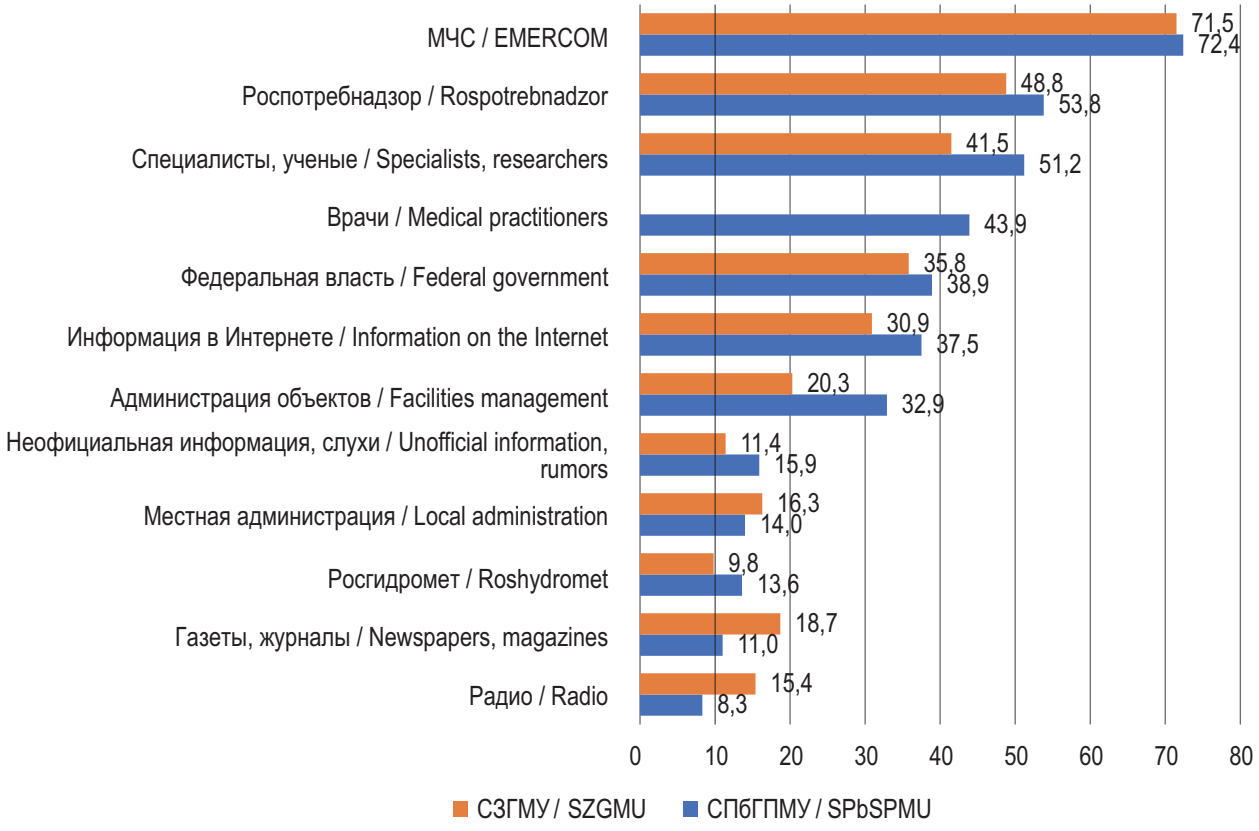

Fig. 4. Public trust in sources in the issue of radiation situation assessment according to respondents (%)

Рис. 4. Общественное доверие источникам информации в вопросе оценки радиационной обстановки по мнению респондентов (%)

to improve environmental literacy of the population were not found (Fig. 5).

The most popular answer was popular science films. Also, significant part of surveyed students supposed localizing the issues of increasing environmental literacy of the population in the education system within the framework of school and university programs. Interest in active and interactive forms (excursions, games, competitions) was declared by a third of interviewees.

The study showed a high degree of students' interest in available source of information about radiation situation. In the structure of information requests of students on radiation issues are leading topics that allow to learn about the fact of radiation accident and ways to maintain health in case it occurs.

Internet has predictably become the most preferred way to receive information on radiation situation. Its use enables to quickly obtain information about various aspects of radiation safety at any convenient time. The Internet provides information from authorities, scientific institutions and independent experts, which allows users to compare various points of view and form their own opinion [13, 14].

Among other things, using the Internet as a source of information, including information related to health issues, is accompanied by a number of risks. Thus, any user can position himself/herself as an expert and publish unreliable information. Some, even official, sources may provide inaccurate or outdated data, which may lead to incorrect risk assessment and actions that may negatively affect one's own health or the health of patients [13]. Using the Internet as a source of information about radiation safety requires the development of critical thinking skills in users. Dissemination of unreliable or distorted information on radiation safety issues may cause a surge in radiation anxiety among the population.

The second most popular source of information is SMS-notification. It allows quickly and effectively inform the population about necessary actions and precautions in case of emergency [15, 16], including a radiation accident. This is especially important in conditions where traditional media may be unavailable or overloaded. Receiving SMS-alerting does not require access to the Internet. This source allows to disseminate information about radiation safety instantly among the population, that is critical in emergency situations. SMS-notification cannot be used in everyday life, but is necessary when there is the potential threat of an accident or its occurrence.

Table 2

Right of authorities to restrict access to information about an accident at a radiation-hazardous facility (%)

Таблица 2

Право органов власти ограничивать доступ к информации об аварии на радиационно-опасном объекте (%)

Вариант ответа / Answer choice	СПбГПМУ,% / SPbGPMU,%	СЗГМУ,% / SZGMU,%
Категорически нет, т.к. в любой ситуации граждане имеют право на своевременное получение полной и достоверной информации / Absolutely not, because dependless on the situation, citizens have the right to receive complete and reliable information	71,8	63,6
Скорее нет, т.к. в современном мире скрыть все равно не удастся — только вызовет недоверие к власти / Rather not, because in the modern world it isn't possible to hide it anyway — it will only cause distrust of the authorities	12,3	8,3
В одних ситуациях это имеет смысл, в других — нет, все зависит от конкретных обстоятельств / In some situations it makes sense, in others not, it all depends on the specific circumstances	10,0	22,3
Скорее да, т.к. большинство простых людей все равно не разбирается в этих вопросах, и считает, что этим должны заниматься специалисты / Rather yes, since most people do not understand these issues anyway, and believe that it should be handled by specialists	1,0	0,8
Безусловно да, если это необходимо для предотвращения паники, беспорядков и других негативных последствий / Absolutely yes, if it is necessary to prevent panic, riots and other negative consequences	3,7	4,1
Затрудняюсь ответить / Hard to say	1,3	0,8

The overwhelming majority of respondents in both universities are in favor of providing the population with complete and reliable information in case of a radiation accident. This complies with the requirements of the laws "On Environmental Protection" and "On Information, Information Technologies and Protection of Information". There legislations prohibit hiding data on the environmental situation from citizens and restricting access to it. Access to such data may not be restricted, except for information that is a state secret under the law of the Russian Federation.

Among all institutional sources of information, the undisputed leaders in terms of public trust are such executive authorities as EMERCOM and Rospotrebnadzor. The competence of EMERCOM includes informing about predicted and existing emergency situations and fires, measures to ensure the safety of the population and territories, methods, and ways of protection. The responsibility of Rospotrebnadzor is inform about the sanitary and epidemiological situation and the measures taken to ensure the sanitary and epidemiological wellness of the population.

The results of the study indicate the importance of developing a specialized information resource. Such resource should contain the entire range of information on existing approaches to ensuring radiation safety during the operation of various SIR, the effects of ionizing radiation on human body and separately on actions in case of a radiation accident. This information resource is advisable to develop jointly by medical educational institutions and specialized institutions of EMERCOM and Rospotrebnadzor, as well as professional societies to reach the target audience (future doctors) and provide it with

Fig. 5. The most effective methods to improve environmental literacy of the population (%)

Рис. 5. Наиболее эффективные методы для повышения экологической грамотности населения (%)

reliable and relevant information. Unfortunately, at the moment there are no such resources in the Russian Federation.

Young specialists may turn to dishonest sources of information, thereby dramatically changing their perception of the danger of ionizing radiation. This is especially important for students of preventive medicine specialties, who after graduation may begin working as radiation hygiene specialist, as well as practicing doctors, for example, radiology surgeons. Inadequate perception of radiation risk (both towards radiation anxiety and towards radiation euphoria) by professionals may negatively affect the provision of sanitary and epidemiological wellness of the population of the Russian Federation and the levels of radiation safety of patients and personnel. Cooperation between the St. Petersburg Research Institute of Radiation Hygiene and SPbSPMU should be aimed, among other things, at developing and supporting such an information resource.

It is important to take into account international experience when developing a website on the Internet dedicated to radiation safety issues in medicine. Similar resources in English have existed for over 15 years and enjoy well-deserved authority and wide popularity among both specialists and patients [17, 18]. At the same time, there is a separate resource on radiation diagnostics of pediatric patients [19].

CONCLUSION

Comparison of the results of the questionnaire of students of SPbSPMU and NWSMU showed the absence of significant differences in most responses. This underlines the adequacy of the research and stable nature of students' information needs and preferences in the methods of receiving information. However, it should be noted that over the past five years, students have increased their demand for information on various emergency situations. It is recommended to supplement the existing training cycles on radiation hygiene with separate classes on responding to radiation accidents to improve student's awareness in case of such an accident, as well as to reduce their radiation anxiety.

It is also useful to develop a specialized resource on the Internet containing reference information on various aspects of radiation safety, as general, as well as specific issues of ensuring radiation safety of patients during individual X-ray examinations. It is important to consider the format of presentation of information, making it available, including through short videos when creating such a resource.

Separate sociological studies to obtain information on the information needs of practicing medical workers in order to improve the quality of additional postgraduate education are also planned.

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. The authors received written consent from the respondents to publish the data.

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 анкетируемых на публикацию данных.

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UDC 94+72.035/.036+725.51+614.2(470.23-25)
DOI: 10.56871/MHCO.2024.67.93.009

ARCHITECTURE OF SAINT PETERSBURG HOSPITALS: FROM PETROVSKY BAROQUE TO HI-TECH. PART IV. BRICK STYLE

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For citation: Mikirtichan GL, Lisenkova LN, Makeeva VI, Nikitina AE, Zhikorentseva PA. Architecture of Saint Petersburg hospitals: from petrovsky baroque to hi-tech. Part IV. Brick style. Medicine and Health Care Organization. 2024;9(2):92–113. DOI: https://doi.org/10.56871/MHCO.2024.67.93.009

Received: 14.05.2024 ***Revised: 17.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. This work continues a research project dedicated to the hospital architecture of St. Petersburg from a historical perspective: from Peter the Great's baroque on to high-tech. The fourth article in the series deals with the period of the brick style in architecture, which is characterized by the use of the aesthetic qualities of durable and cheap brick instead of traditional plaster. Buildings with brick cladding were erected in a shorter time, were more durable in the Russian climate, were cheaper and were beneficial for regions where the delivery of natural stones was associated with large financial costs. Thanks to these qualities, the brick style has become widespread in the architecture of St. Petersburg. It has gained particular popularity in the construction of industrial buildings. The rapid growth of the city's enterprises entailed the need to organize medical care for factory workers and, as a result, gave impetus to the development of factory medicine. Examples of factory medical institutions belonging to the brick style are the hospital of the Obukhovsky plant, the infirmary of the Okhtinsky gunpowder plant, and the hospital at the Aleksandrovsky plant of the Nikolaev railway. The artistic and architectural-compositional features of the brick style are also examined on the example of the Volkovskaya merchant almshouse, the Exchange Merchants Hospital in memory of Alexander II, the Evgenievskaya Community of Sisters of Charity of the Red Cross, and the Alexander Women's Shelter. The construction of these buildings is associated with another characteristic trend of the era — the development of the charitable movement. Construction was carried out through the active attraction of funds from the enterprises themselves, class and religious organizations and private donations. Despite its rationality, the brick style developed in the general mainstream of the architecture of the eclectic period, using the distinctive features of historical styles. Characteristic features of this time are the gradual spread of a decentralized system of hospital construction, which was based on the desire to disperse patients and a clearer planning separation of hospital departments, which helped reduce nosocomial infections; the use of new ventilation systems, room lighting and other technical innovations.

KEYWORDS: Saint Petersburg, hospital architecture, brick style, Volkovskaya merchant almshouse, Hospital of the Exchange Merchants in memory of Alexander II, Evgeniyevskaya community of sisters of mercy, Obukhov Plant Hospital, Infirmary of the Okhtinsky Powder Plant, Alexandrovsky Women's Shelter

АРХИТЕКТУРА БОЛЬНИЦ САНКТ-ПЕТЕРБУРГА: ОТ ПЕТРОВСКОГО БАРОККО К ХАЙ-ТЕКУ. ЧАСТЬ IV. КИРПИЧНЫЙ СТИЛЬ

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Для цитирования: Микиртичан Г.Л., Лисенкова Л.Н., Макеева В.И., Никитина А.Е., Жикоренцева П.А. Архитектура больниц Санкт-Петербурга: от петровского барокко к хай-теку. Часть IV. Кирпичный стиль // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 92–113. DOI: https://doi.org/10.56871/MHCO.2024.67.93.009

Поступила: 14.05.2024 ***Одобрена: 17.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. Данная работа продолжает исследовательский проект, посвященный больничной архитектуре Санкт-Петербурга в историческом ракурсе: от петровского барокко к хай-теку. Четвертая статья цикла рассматривает период кирпичного стиля в архитектуре, для которого характерно использование эстетических качеств прочного и дешевого кирпича взамен традиционной штукатурки. Строения с облицовкой кирпичом возводились в более короткие сроки, имели бóльшую прочность в российском климате, стоили дешевле и представляли выгоду для регионов, где доставка естественных камней была связана с большими финансовыми затратами. Благодаря этим качествам кирпичный стиль получил широкое распространение в архитектуре Санкт-Петербурга. Особую популярность он приобрел в строительстве промышленных зданий. Стремительный рост предприятий города повлек за собой необходимость организации медицинской помощи рабочим фабрик и заводов и, как следствие, дал толчок для развития фабрично-заводской медицины. Примером заводских медицинских учреждений, относящихся к кирпичному стилю, являются больница Обуховского завода, лазарет Охтинского порохового завода, больница при Александровском заводе Николаевской железной дороги. Художественные и архитектурно-композиционные особенности кирпичного стиля также рассмотрены на примере Волковской купеческой богадельни, больницы Биржевого купечества в память Александра II, Евгениевской Общины сестер милосердия Красного Креста, Александровского женского приюта. Возведение этих зданий связано с другой характерной тенденцией эпохи — развитием благотворительного движения. Строительство шло за счет активного привлечения средств самих предприятий, сословных и религиозных организаций и частных пожертвований. Несмотря на свою рациональность, кирпичный стиль развивался в общем русле архитектуры периода эклектики, используя отличительные черты исторических стилей. Характерными особенностями этого времени являются постепенное распространение децентрализованной системы больничного строительства, в основе которой лежало стремление к рассеиванию пациентов и более четкое планировочное обособление отделений больницы, способствовавшие снижению внутрибольничного инфицирования, использование новых систем вентиляции, освещенности помещений и других технических новшеств.

КЛЮЧЕВЫЕ СЛОВА: Санкт-Петербург, больничная архитектура, кирпичный стиль, Волковская купеческая богадельня, Больница Биржевого купечества в память Александра II, Евгениевская Община сестер милосердия Красного Креста, Больница Обуховского завода, Лазарет Охтинского порохового завода, Александровский женский приют

Brick style is a rationalistic direction of architecture of the late XIX century, one of the directions of eclecticism[1]. Its main feature is the complete absence of exterior wall finishing (plaster, decorative tiles, moldings), the brickwork itself fulfilled a decorative function. This type of construction

[1] This article is a continuation of the series of articles on the architecture of hospitals in St. Petersburg published in previous volumes of the journal Medicine and Health Care Organization [1–3].

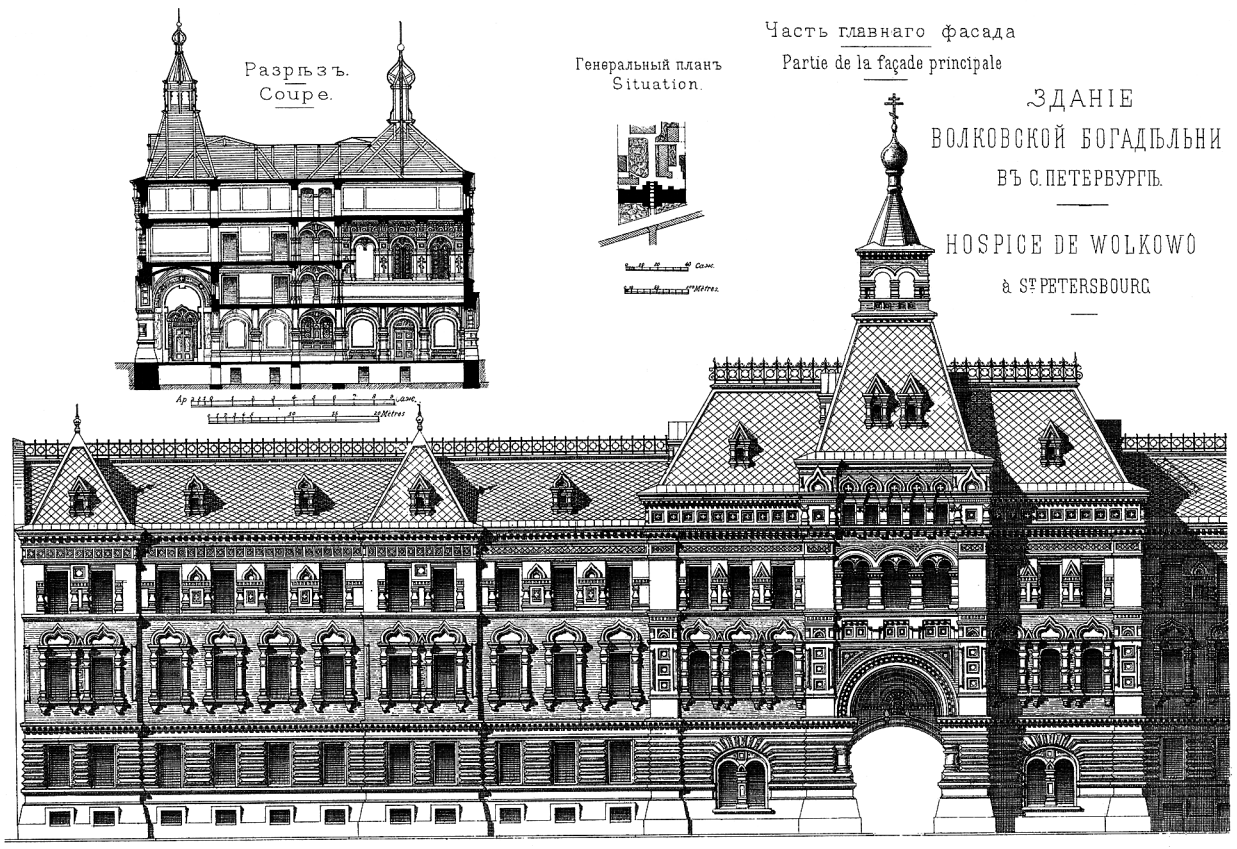

Fig. 1. Volkovskaya almshouse project [8]

Рис. 1. Проект Волковской богадельни [8]

could use both “classic red” clay bricks and multi-colored bricks covered with glaze. Buildings constructed with this technology were faster and cheaper to build, were stronger than plastered ones and retained their appearance much longer. One of the founders of brick style I.S. Kitner (1839–1929) noted: “There is no sensible reason not to use the advantages of the material from which the building is erected and hide it under a layer of plaster” [4]. The utilitarian nature of buildings ensured their mass popularity among service buildings such as factories, hospitals, military units [5, 6].

An example of the synthesis of brick and Neo-Russian styles is the Volkovskaya Merchant Almshouse (3 Volkovka River Embankment). In 1784 merchant F.F. Kvastsov built a wooden men’s almshouse for Old Believers-Fedoseevites on the embankment of the Volkovka (Chernaya) river near the Lutheran Volkovka cemetery. Following the assassination attempt against Alexander II on 2 April 1879, the Old Believers of St. Petersburg decided to establish a special ward for sixty beneficiaries and an orphanage for the same number of children at the Volkovskaya almshouse in memory of the Emperor’s miraculous deliverance from death. The project of the architects F.I. Gaberzetel (1832–1909) and A.I. Tomishko (1851–1900) was a solemn, elegant building, reminiscent of a fairy-tale house: rich color scheme, bright kokoshniks, platbands, high roof with openwork lattice on the ridge, with turrets and hipped roofs (Fig. 1, 2). It was planned to cover the facade walls of the basement, the first and second floors with clean masonry using hewn and molded bricks on cement mortar. The upper floor and the main cornice were exposed to plaster. The hollows were intended to contain colored tiles, balusters under the kokoshniks and other decorations made of pottery [7].

The construction began in 1880 under the direction of F.I. Gaberzetel. But after Alexander II died on 1 March 1881, the solemnity and elegance of the building devoted to the salvation of the sovereign became inappropriate in the light of these tragic events [10]. There was not enough time to make the roof look as designed, the finishing of the building was delayed and was not carried out outside at all.

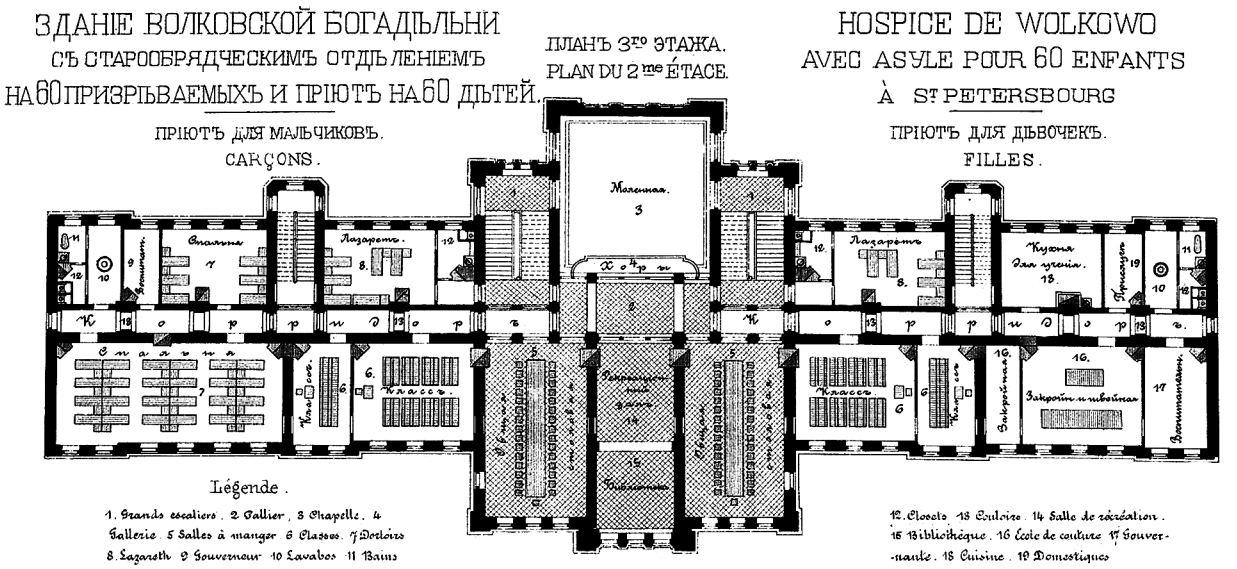

Fig. 2. The building of the Volkovskaya almshouse. 3rd floor plan [9]

Рис. 2. Здание Волковской богадельни. План третьего этажа [9]

Besides, after the Law "On the Rights of Schismatics" issued on 3 May 1883 came into force, the construction of the main building of the almshouse became illegal[1]. Although the construction was not completed, it perfectly conveys the stylistics and motifs of Old Russian architecture. Floor division is emphasized by continuous cornices and various wall finishes. The ground floor is decorated with a high banded rustication[2], the second floor is distinguished by the design of windows with platbands in the form of kokoshniks on shaped columns, the third floor is marked by framing windows with fielded panels[3] with dentils and screens in the partitions. The crowning cornice with dentils and a wide frieze of widths is made only over the side parts of the building (Fig. 3). There is a three-stage avant-corps with an arched passage in the central part of the facade (Fig. 5). The windows are of different design: rectangular on the ground floor, semi-circular with keel-shaped centerpiece and columns with interceptions — on the second floor, Florentine with weights — on the third floor (Fig. 4), semi-circular three-part window framed by a profiled archivolt with teeth — above the gateway.

By 1888, the building had not been completed yet. Only one third of the rooms were finished and occupied by Old Believer women. Most of the windows were covered with boards [13]. The idea to arrange a children's orphanage in the new building was not carried out either. According to the information for 1898 there were no children in the almshouse [14]. After the revolution the building housed children's medical institutions. Since 1918 the former Volkovskaya almshouse served as a hospital for refugee children of the Petrograd Society in memory of N.I. Pirogov, which later became simply the N.I. Pirogov Hospital [15, 16]. In the 1960s, the building housed the United Children's Hospital of Frunzensky District and Children's Polyclinic No. 4, in the 1970s Children's Hospital No. 21 was located there. Since 2009 the building has housed the City Skin and Venereological Clinic (Fig. 5).

Brick style became a unique symbol of industrial architecture and was actively used as the most rational direction in terms of climatic conditions, simplicity of construction and economical operation. Russian industrialization of the second half of the XIX century manifested by the creation of large industrial and factory production, and the formation of factory medicine. Factory medicine is a form of medical care for factory workers in medical institutions organized by the management of enterprises. Labor conditions at many production

[1] The law allowed the construction of prayer rooms in existing private residences, but prohibited the construction of new public buildings for prayer rooms or the construction of schismatic almshouses, hospitals, cemeteries and similar public institutions [11].

[2] Banded rustication — finishing the façade (usually the lower part) with deep horizontal incisions without vertical joints.

[3] Fielded panels — a frame border together with an inner field, most often rectangular in shape

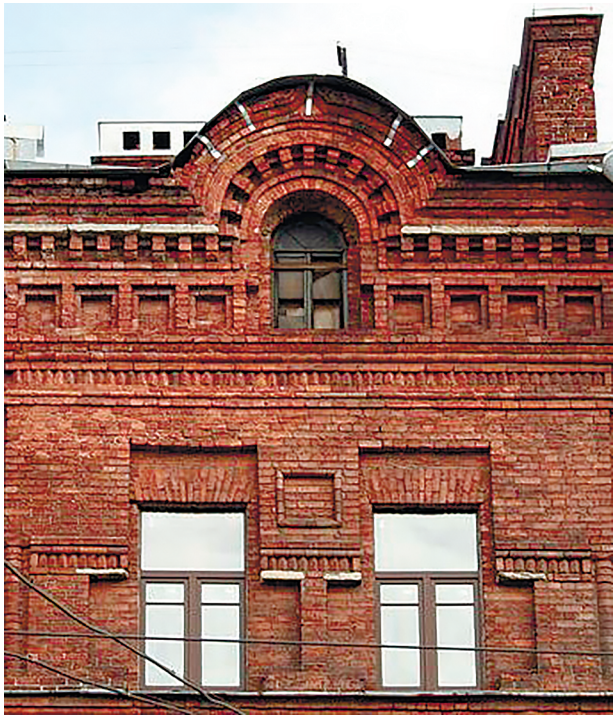

Fig. 3. Elements of the side part of the facade of the building of the Volkovskaya merchant almshouse [12]

Рис. 3. Элементы боковой части фасада здания Волковской купеческой богадельни [12]

Fig. 4. Decoration of the windows of the central risalit of the building of the Volkovskaya merchant almshouse [12]

Рис. 4. Оформление окон центрального ризалита здания Волковской купеческой богадельни [12]

Fig. 5. City dermatovenerological clinic. Modern look [17]

Рис. 5. Городской кожно-венерологический диспансер. Современный вид [17]

facilities were characterized as unfavorable and harmful, sanitary norms were not observed, and all this contributed to a high level of injuries, morbidity and mortality. The law of 1866 “On the arrangement of hospital premises at factories and plants in Moscow province” was one of the first laws on factory medical care, which obliged the owners of enterprises with more than one thousand workers to arrange hospitals at the rate of one bed per 100 people [18]. Although the law initially applied

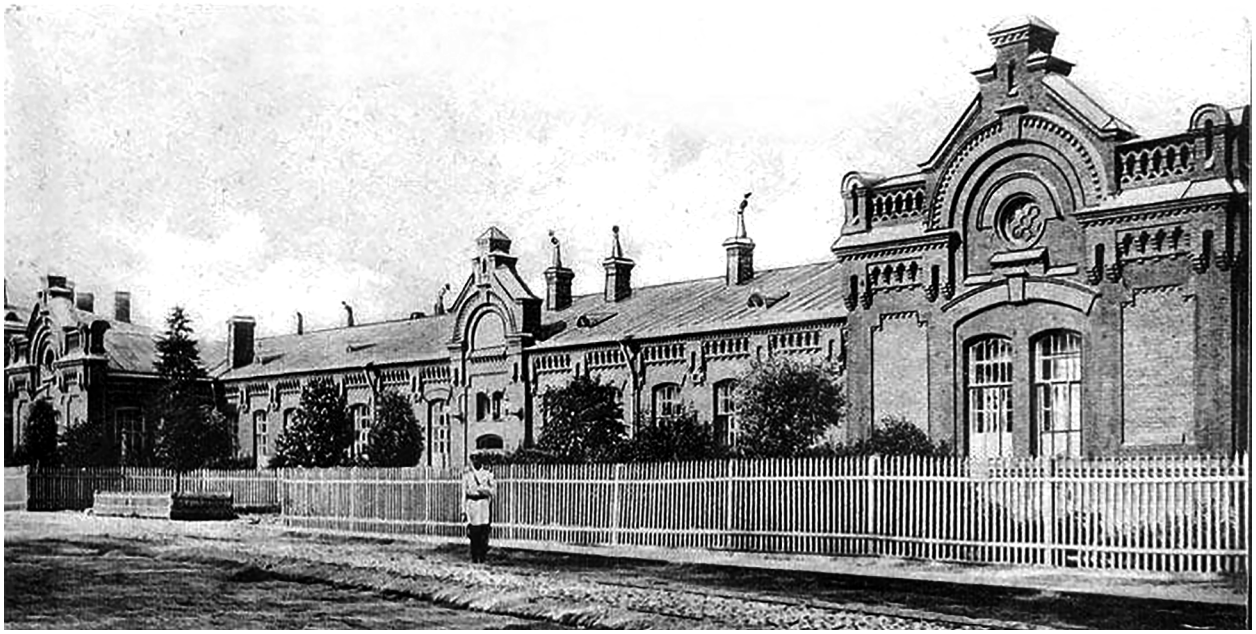

Fig. 6. Hospital of the Obukhov plant. 1903 [17]

Рис. 6. Больница Обуховского завода. 1903 г. [17]

to the Moscow province, from 1867 it came into force throughout the Russian Empire according to the decree of the State Council.

The Obukhov factory was one of the first large industrial enterprises in the capital to organize medical care for its employees. In 1865, an infirmary for workers was established there. By 1885, the number of infirmary beds had increased, two outpatient clinics were organized. Among the employees were six doctors, two paramedics, an orderly and a cleaner; the equipment of the rooms was improved. However, the influx of patients required the factory management to increase the bed fund. In 1897–1898 the funds donated by one of the founders of the plant P.M. Obukhov (1820–1869) were used to build the hospital of the Obukhov factory (124 Obukhovskaya Oborona Avenue) and a house for the hospital administration with an outpatient clinic (120 Obukhovskaya Oborona Avenue). The hospital was designed for 120 beds, there were wards of different capacity: 36 beds in a general ward and 6 beds in separate wards. It is noteworthy that there was a maternity hospital for seven beds. Treatment was available both for workers, and their parents, wives and children [19–21]. The buildings built by architect F.F. Lumberg (1867 — after 1917) fit harmoniously into the appearance of the surrounding industrial buildings: massive unplastered walls and brick decor, large

Fig. 7. Hospital of the Obukhov plant. Side projection pediment [17]

Рис. 7. Больница Обуховского завода. Фронтон бокового ризалита [17]

windows for good illumination of interior spaces. A symmetrical side avant-corps (Fig. 6) decorates the elongated one-floor building of the hospital. Their gable is crowned with a turret, in the tympanum[1] there is a perspective arch decorated with dentils, its masonry in the center imitates a castle stone. A small round window inside is decorated with a geometric flower, referring to the images

[1] Tympanum — the field of a pediment, gable or zakomara limited by an extended projection.

Fig. 8. House for the administration of the Obukhov plant hospital with an outpatient clinic [23]

Рис. 8. Дом для администрации больницы с амбулаторией [23]

of the Gothic rose window (Fig. 7). The cornice is decorated with dentils and a row of four-stage machicolations[1], the brickwork imitates a blind balustrade. The form of the windows interprets the Renaissance Florentine window[2]: it consists of several ray arches united by one. The masonry in the center of the lintel imitates a capstone. They are flanked by false windows with dentils. The false central avant-corps is highlighted by pilasters at the corners, framing the entrance of the building. The pediment repeats the form of the side avant-corps, however, there are figures instead of a window in the tympanum. These figures indicate the year of construction (1897). Above the entrance there are small windows with a beam lintel separated by a column (Fig. 8).

After the revolution, the building continued to serve as a medical facility of the factory. In 1922 it was renamed into the Petrograd State Ordnance Optical and Steel Works Factory "Bolshevik". During the war years it housed a military field hospital of the 55th Army of the Leningrad Front, since 1973 — Hospital No. 24, since 2007 — the central office of the production-technological complex "Moderam" [22].

One building is especially interesting. It is the house for the hospital administration and an outpatient clinic which occupies two-floor, rectangular building. The symmetrical facade with plastered details is faced with red brick, rustication decorates the ground floor and corner parts of the building. The crowning cornice is profiled, has dentils. The floors are divided by a draught belt with molded garlands and "running wave" ornament. The windows of the ground floor have rectangular shape, they are profiled with platbands with keystones, underneath there are fillets; the windows of the second floor have rectangular shape with profiled platbands with "ears", the windows of oriels, situated on the edges of the building, are arched. Doorways are arched with a fan rusticated archivolt, decorative molded brackets of the side oriels frame the entrance. In 2014, the building was handed over to the Obukhov Factory History Museum (Fig. 8).

Another example of a medical institution built in brick style is the hospital at the Alexandrovsky Factory of the Nikolayevskaya Railway (13 Tsimbalina Str.), which began operating from the foundation of the enterprise in 1826. The hospital was designed for 40 beds and occupied the ground floor of the wooden building of the former barracks for workers. By the end of the XIX century, a new building had to be constructed due to expansion of the plant. The construction plan was drawn up by the Road Administration in 1898. The whole complex of buildings was erected according to the project of L.P. Shishko (1873–1942) and under the supervision of civil engineer N.N. Ignatyev (1865 — after 1920).

[1] Machicolation — hinged loopholes located in the upper part of fortress walls and towers.

[2] Florentine window — a double or triple window with arched terminations united by one large arch.

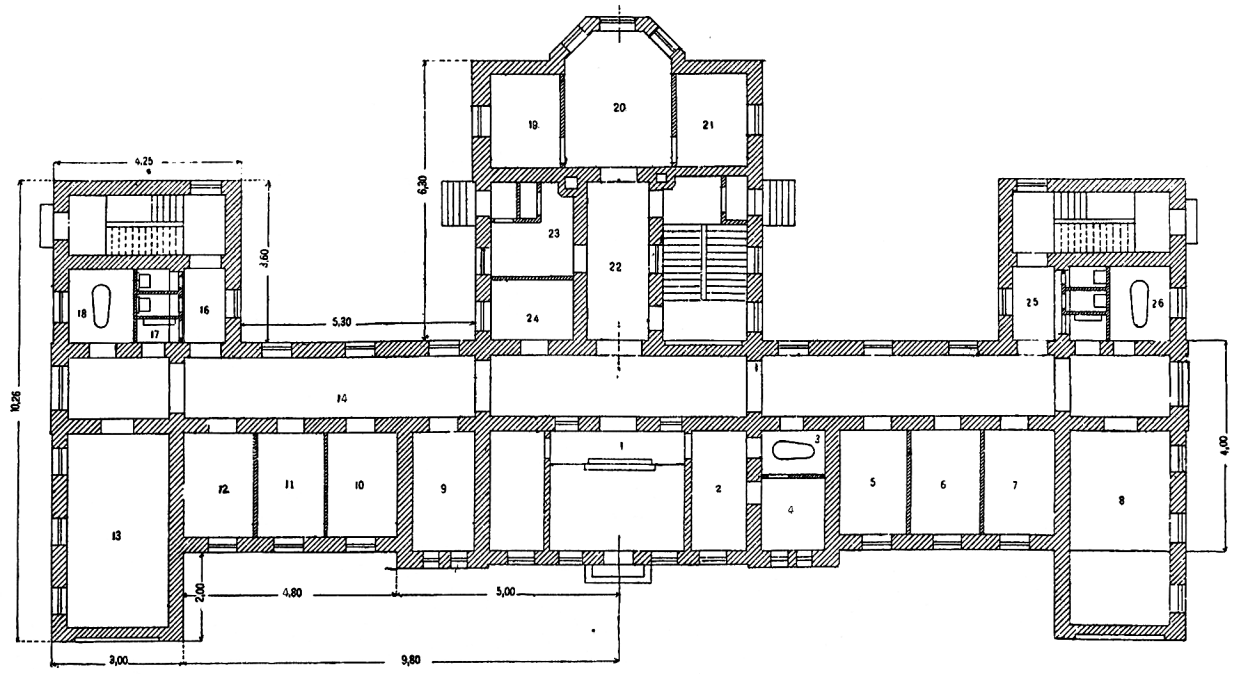

Fig. 9. Hospital at the Aleksandrovsky plant of the Nikolaev railway. 1st floor plan [24]

Рис. 9. Больница при Александровском заводе Николаевской железной дороги. План первого этажа [24]

The hospital building has two floors arranged in a W-shape. The brickwork of the facade creates relief forms: lesenes, protruding wedge-shaped lintels of wide windows with keystones, shaped niches, dentils and turrets.

The hospital was arranged according to the corridor type (Fig. 9). The ground floor housed a reception room, a paramedic, six wards for two people, a sterilization room, an operating room, and a room for instruments; the second floor housed a maternity ward, wards for two, three, and six people, and one ward for a difficult patient. The windows of the wards faced south. Each floor had its own cupboard, laundry, toilets and bathrooms. Two wooden barracks housed contagious patients. A pharmacy with a dispensary, a kitchen and a laundry with a disinfection chamber, a chapel connected with a funeral parlor and a sectional room were located in separate buildings. In addition to the employees of the plant and their families, the nearest doctor's stations were served here.

After the revolution, the clinic was renamed the Hospital at the Proletarsky and Oktyabrsky factories of the Oktyabrskaya railway (Fig. 10). In 1996, after the factories were closed, the building was transferred to the hospital of internal troops. Now the complex is under the jurisdiction of the 3rd military hospital of the National Guard troops of the Russian Federation. Reconstruction has been ongoing for several years [24, 25].

The brick style also includes the complex of buildings of the Okhta gunpowder plant. Medical service had appeared at the plant since 1816, but the infirmary received its own premises only in 1881 — it was designed for 25 beds. By the end of the XIX century the one-floor wooden building of the infirmary accommodated up to 6316 people (taking into account employees with their families). As the infirmary building was dilapidated, unusable and did not fulfil its purpose, the construction of a new stone building (10 Krasina Street) was started in spring 1910. The project envisaged construction of three buildings for 75 beds: the main one (42 beds) served for internal and surgical diseases, as well as women's and contagious departments. Each building had its own special medical staff. The construction of new buildings according to the project of architects V.Y. Simonov (1856–?) and A.A. Pashikhin (1870–?) had been completed by 1912, finishing works continued until 1914. The main building of the infirmary looks restrained.

Fig. 10. Exterior view of the Proletarsky Plant hospital. Photo: S.A. Magaziner, 1927

Рис. 10. Внешний вид больницы Пролетарского завода[1]. Фото: С.А. Магазинер, 1927 г.

Fig. 11.Infirmary of the Okhtinsky gunpowder plant. Main building [17]

Рис. 11 Лазарет Охтинского порохового завода. Главное здание [17]

Gothic elements add a touch of “romanticism” to its austere appearance: crenellated gable ends, turrets on the corners of the building (Fig. 11).

In 1912–1914 the infirmary mostly treated workers and foremen of the plant. Many patients were diagnosed with diseases caused by industrial factors such as burns, injuries, facial wounds, gas and acid poisoning, various fractures and diseases of the respiratory and digestive systems. Patients with surgical and complicated diseases

[1] Central State Archive of Film, Photo and Sound Documents of St. Petersburg. Photodocuments. Op. 1GR-10. Ed. chr. 12028.

were sent to city hospitals, mainly to the Nikolayevsky Hospital, Obukhov and Petropavlovsk hospitals.

Currently, the historical buildings of the Okhta Gunpowder Factory have been transferred to the North-West District Research and Clinical Centre named after L.G. Sokolov [26][1]. Restoration works are being completed.

The period of barrack hospital construction is an important stage in the history of hospital care. They developed and shaped basic hygienic requirements for the hospital layout. Barracks were arranged at a distance from each other to ensure the most favorable conditions of aeration and insolation for hospital premises. Separation of patients according to the type of illness and placing them separately contributed to the reduction of hospital-acquired infections.

V.A. Shreter (1839–1901) was one of the main initiators and propagators of the brick style. He designed the Hospital of the Exchange Merchants in memory of Alexander II (Bolshoi Prospect of Vasilievsky Island, 77/17). The architect gained a new experience of building a medical institution. Initially, the hospital was intended for men, mainly those who were associated with the activities of the St. Petersburg port. The design program was developed with the assistance of doctors N.F. Zdekauer, I.V. Bertenson and N.I. Sokolov. The St. Petersburg City Alexander Barracks Hospital named after S.P. Botkin (3 Mirgorodskaya Str.) served as a model in many respects. On 25 July 1887 the hospital was laid, and on 6 December 1889 the hospital began to receive patients. The complex included a stone two-floored dwelling house of administration (Fig. 12), one-floor stone and partly wooden building of the reception center with an office, an outpatient clinic and a pharmacy, three wooden one-floor pavilions for fourteen beds each: for non-infectious patients, typhoid and patients with other infectious diseases (Fig. 13); a wooden one-floor pavilion with a central stone part for surgical and convalescent patients with an operating theatre (Fig. 14), a one-floor wooden building with a parsonage, a section, a stable and a barn; a laundry with a disinfection chamber, a stone chapel, a stone one-floor building with an engine room and a bathhouse, an icehouse. When the hospital was opened, it turned out that the most frequent patients were admitted to the surgical department. Therefore, the second pavilion was built on the donations of merchant G.P. Eliseev (1864–1949), it was a stone one-floor building with an operating theatre and a

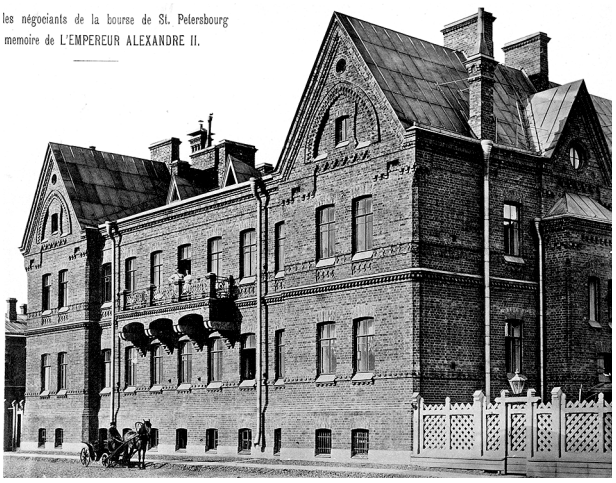

Fig. 12. Hospital of the St. Petersburg Exchange Merchants in memory of Alexander II. Administration House [29]

Рис. 12. Больница Санкт-Петербургского Биржевого купечества в память Александра II. Дом администрации [29]

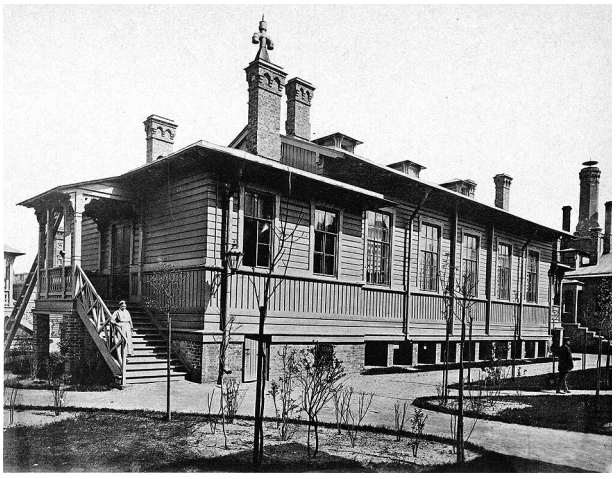

Fig. 13. Hospital of the St. Petersburg Exchange Merchants in memory of Alexander II. Wooden barrack [30]

Рис. 13. Больница Санкт-Петербургского Биржевого купечества в память Александра II. Деревянный барак [30]

[1] In July 1919 the infirmary was renamed into the Porokhovskaya Hospital. In 1927 it was named after L.B. Krasin, then in 1952 the hospital was named as the United Hospital after L.B. Krasin, finally, in 1970 it was assigned No. 13. Since 2003 the building has been reassigned to the Scientific and Treatment Centre for Veterans of Special Risk Units. Then, when it was merged with Polyclinic No. 2 of the Arsenal Machine-Building Plant, it became Medical Centre No. 144, which in turn was transferred to Clinical Hospital No. 122 named after L.G. Sokolov in 2015.

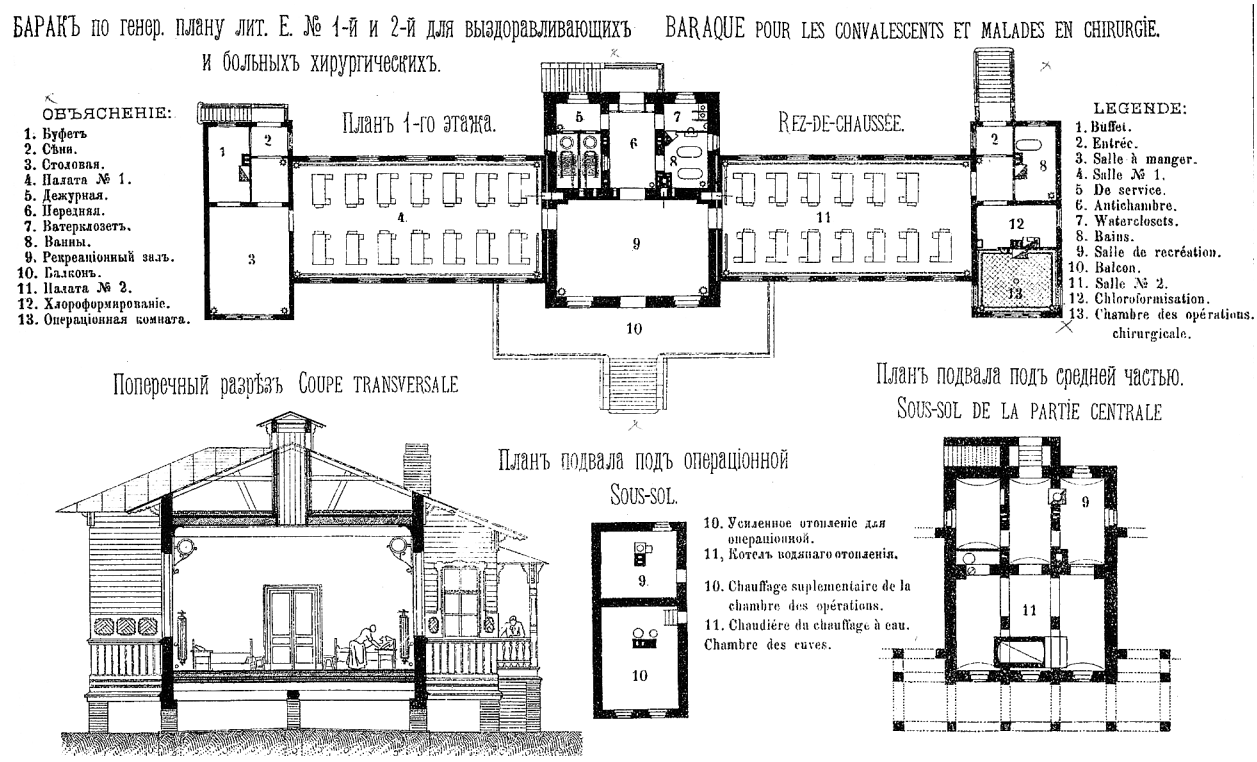

Fig. 14. Plan of barracks No. 1 and No. 2 for convalescent and surgical patients [31]

Рис. 14. План бараков № 1 и № 2 для выздоравливающих и хирургических больных [31]

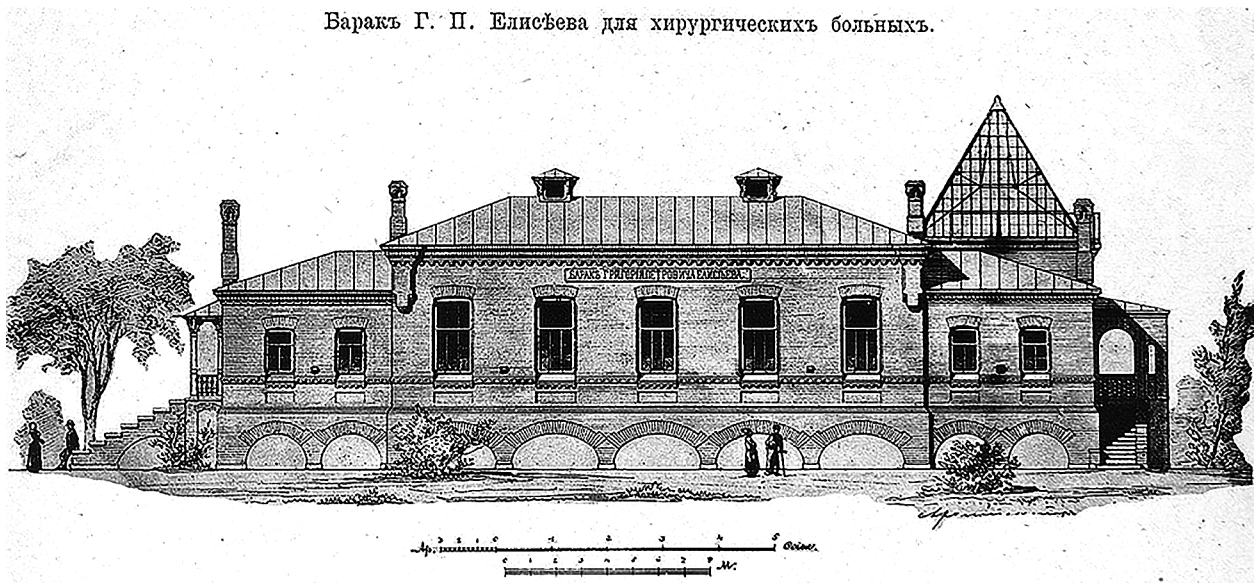

Fig. 15. G.P. Eliseev barak for surgical patients [32]

Рис. 15. Барак Г.П. Елисеева для хирургических больных [32]

ward for surgical patients, which was called "G.P. Eliseev's barrack" (Fig. 15). The pavilions were made of wood because the material was cheap. Their peculiarity was installation on brick pillars. The underground remained open, which allowed air to ventilate the wards from all sides, thus protecting them from harmful vapors rising from the soil. The hospital was the first to install electric lighting. All the pavilions were surrounded by specially planted greens [27,

28]. The buildings of the hospital were decorated modestly: beam lintels of windows, stepped consoles, rows of pavements or shaped bricks, small turrets on the roofs. The wooden barracks are decorated with carvings in the Russian style. Now the buildings of the former St. Petersburg Exchange Merchant's Hospital in memory of Emperor Alexander II house the Children's City Infectious Diseases Hospital No. 3.

The brick style also includes the hospital of the Eugenia Community of Red Cross Sisters of Charity (3 Starorusskaya Str.), founded on the initiative of Princess Eugenia Maximilianovna Oldenburgskaya (1845–1925)[1]. On 30 June 1896 a shelter dedicated to Emperor Alexander III for elderly sisters of mercy were laid. It was located at the corner of Starorusskaya and Novgorodskaya Streets, and housed the community of St. Eugenia with a hospital and training courses, as well as a hospital pavilion in memory of Emperor Alexander III. The hospital pavilion for 26 surgical patients was also laid in memory of St. Great Martyr Demetrius of Solunsk and St. Great Martyr Sophia [35]. Pavilion named after Emperor Alexander III and other buildings were erected on the donations of benefactors and the funds of the Committee of Trustees Community. In order to strengthen fundraising for the construction, in 1896 the Committee of Trustees began to publish open letters (Fig. 16–17) and artistic envelopes. They could be used to send business cards (for a long time these envelopes were called "instead of visits") [36–38][2].

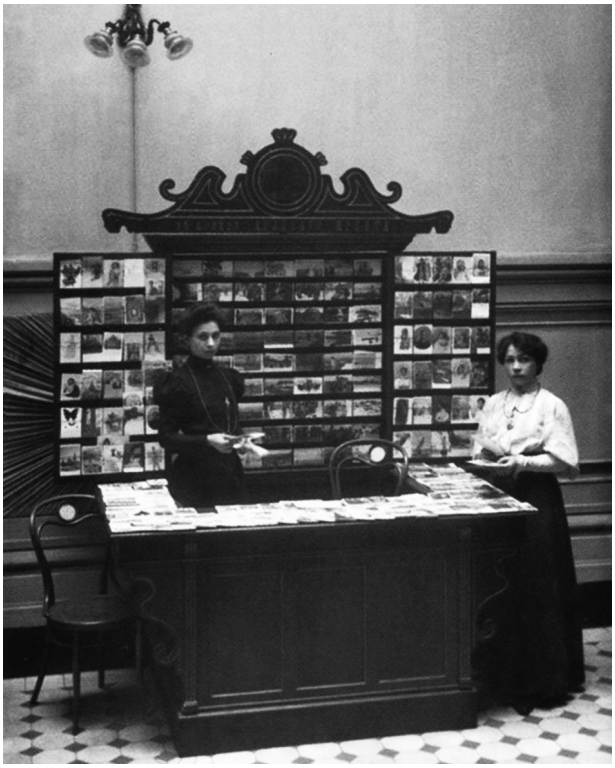

Fig. 16. Kiosk selling "Open Letters". Saint Petersburg. Photo: K. Bulla, 1912 [17]

Рис. 16. Киоск по продаже «Открытых писем». Санкт-Петербург. Фото: К. Булла, 1912 г. [17]

On 14 January 1900, the outpatient clinic was consecrated and the barracks of the community were opened: a therapeutic barrack in the name of Emperor Alexander III and a surgical barrack in honor of Saints Demetrius of Solunsk and Martyr Sophia [40]. On 14 December 1900 the hospital pavilion named after Empress Alexandra Fyodorovna was opened, it included two departments: gynecological and women's therapeutic ones. The latest requirements of hygiene and medical science [41] were taken into account when arranging the premises, including improved ventilation systems, lighting, laboratory equipment with the possibility of using experimental-laboratory methods of research. A church in the name of Blessed Grand Duke Alexander Nevsky and Saint Martyr Eugenia for 400 people was built on the first floor. The

[1] The Eugene Community of the Red Cross Sisters of Mercy was established under the St. Petersburg Committee for the Care of the Red Cross Sisters of Mercy in early April 1882. Some sisters of mercy were involved in the Russian-Turkish War of 1877–1878 and the Akhal-Teke expedition of 1880–1881, after the end of these dramatic events they found themselves without work and means of subsistence. In order to help them, a committee was established, and in late 1886 Princess E.M. Oldenburgskaya took over its patronage, and on 7 January 1893, in memory of the 25th anniversary of her marriage to Alexander Petrovich Oldenburgsky, the dormitory of the Committee's sisters was renamed the Community of St. Eugenia [33, 34].

[2] Envelopes for Easter and Christmas were issued in the first year, and from 1897 open letters began to be issued. At that time only postcards with city views were issued in Russia. I.M. Stepanov, who became the head of the Community's publishing house, proposed the idea of publishing artistic open letters. At first, postcards were issued only twice a year, the anniversary of A.S. Pushkin and the anniversary of St. Petersburg attracted new artists and launched the increase of editions. The circulation of the Community's postcards, initially a few hundred copies, later increased to 10,000. Through its publishing activities, the Community gained nationwide fame. Famous artists engaged in the work created not only front sides of the cards, but also address sides, with the same care. Community signs were designed using one of the main symbols of medicine — the red cross — in various colour and graphic variations.

Fig. 17. An open letter to the community of St. Eugenia. Artist: E.M. Boehm [39]

Рис. 17. Открытое письмо в пользу общины Св. Евгении. Художник Е.М. Бём [39]

church was elegantly finished with gilding. The wells were painted with light colors, the space of the church was full of light and air [42]. The architect D.K. Prussak (1859 — after 1917) supervised the construction of the complex. The main building of the Community has two or three floors[1] and an angular shape. The facade decoration is based on the contrast of horizontals and verticals. The building is partitioned vertically with lesenes, the floor division is emphasized by a continuous cornice at the level of the second and third floors and by screens at the level of the fourth floor. The crowning cornice is decorated with small turrets with niches and an arcature belt. The corner three-stage avant-corps is decorated with pilasters and three large arched windows (Fig. 18).

In 1917, after the revolution, the community was liquidated. The hospital continued to function, in October 1918 it was named after Friedrich Adler, in April 1921 — after Y.M. Sverdlov. Since 1990 it was remained as City Hospital No. 46, and in 1993 it regained the original name “St. Eugenia Hospital”.

The building of the Alexandrovsky Women’s Shelter[2] (Bolshoy pr. Vasilievsky Island, 49–51)

Fig. 18. The building of the Evgenievskaya Community of Sisters of Mercy of the Red Cross. Modern look [17]

Рис. 18. Здание Евгениевской Общины сестер милосердия Красного Креста. Современный вид [17]

was constructed in 1897–1899 according to the project of one of the brightest representatives of the brick style — architect K.K. Schmidt (1866–1945). The orphanage was built on private funds of benefactors — evangelist parishioners. Major industrialists L.L. Koenig, E.L. Nobel, G.G. van Gilze van der Pals, M.L. Otmar-Neischeller, K.G. Faberge made a great contribution. In order to raise funds for the construction of the women’s hospital and maternity hospital, a committee was established in December 1893 on the initiative of Bishop Konrad Freifeld and Dr Karl Germanovich Wiedemann (1850–1918), the future chief physician and

[1] In 1905–1908 the hospital buildings were substantially rebuilt and expanded under the supervision of civil engineer F.A. Sitnikov. The pavilion named after Alexander III was extended by two floors. On the first floor there were organized free therapeutic wards named after Princess E.M. Oldenburgskaya, on the third floor there were an operating room, laboratories, water treatment and electrification rooms. In 1912, the Bodo Egerstorf company built a concrete chapel for funeral services.

[2] The Empress Alexandra Feodorovna was pleased to allow naming the new hospital in her honor. Ten years later, in 1905, she accepted patronage over the orphanage. There may be different variants of the name: Alexandrovsky and Alexandrinsky.

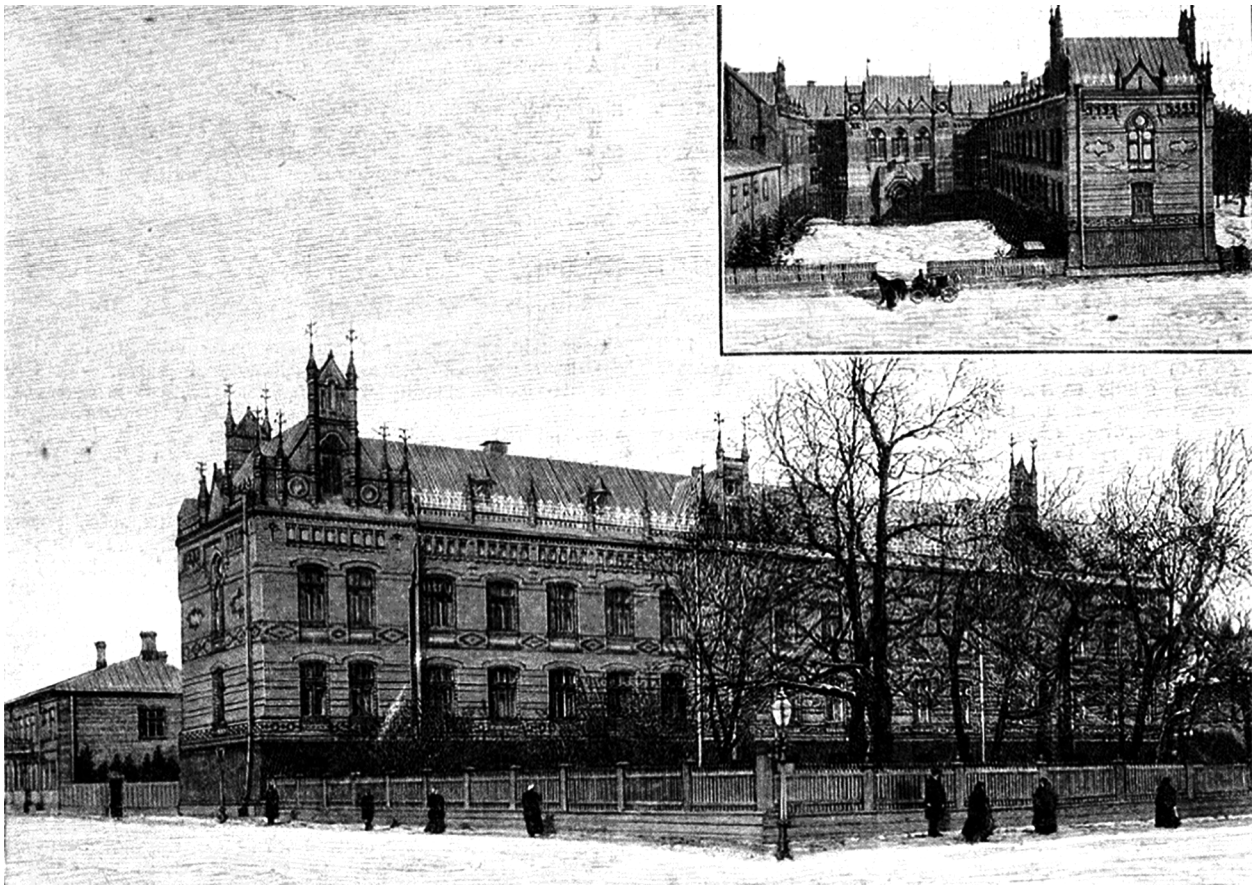

Fig. 19. View of the building of the Alexander Women's Shelter from Bolshoy Prospekt of Vasilievsky Island and from the 14th line of Vasilievsky Island. Main entrance. Based on a photograph by K. Bulla, engraver M.N. Rashevsky [44]

Рис. 19. Вид здания Александровского женского приюта с Большого проспекта Васильевского острова и с 14-й линии Васильевского острова. Главный вход. По фотографии К. Булла, гравер М.Н. Рашевский [44]

director of the hospital complex[1]. The building was consecrated and ceremonially opened on 7 March 1899. A midwifery school was established in the orphanage in September 1899.

The orphanage building has three floors and a "P" shape. One of the wings was shortened because of the house in front of the building on the 14th line of Vasilievsky Island (Fig. 19). Side wings were surrounded by an open courtyard where the main entrance was located (Fig. 20). The side wings had service entrances and staircases. A garden adjoined the building from the Bolshoi Avenue side. In 1927, after the reconstruction of the avenue, it became part of the general boulevard.

The building was executed in the Romanesque-Gothic style. The facade was finished with foreign light and dark facing bricks, and for the first time in St. Petersburg fluted bricks were used. The ground floor is marked with dark red bricks, the second and third floors with light yellow bricks with horizontal stripes, geometric patterned belts and red brick inserts (Fig. 21). The southern facade of the building, stretching along the large Vasilievsky Island

[1] In January 1895, permission was obtained from the city administration to build the planned hospital and organise a medical practice. On 8 November 1895 it was opened in the premises of the profitable house No. 34 on the 7th line of Vasilievsky Island. Later, the hospital's Board of Trustees purchased two adjacent houses on the Bolshoy Prospect of Vasilievsky Island for building: in the beginning of 1895 from the heirs of merchant I.G. Luther — plot No. 49, and a year and a half later — from the Bauman-Gauderer family — plot No. 51/13 on the corner of the 14th line. The design was initially launched by the architect P.V. Alish (1842 — after 1917), then the order was fully transferred to K.K. Schmidt. The clients obliged the architect to consult with the main authorities of the rationalist direction — V.A. Schroeter and I.S. Kitner.
In 1897, thanks to generous donations, it became possible to expand the territory of the future hospital, having bought an adjacent plot on Bolshoi Prospekt — today it is house No. 51 [43].

Fig. 20. Reception of women in labor at the main entrance of the Alexandrovsky Women's Shelter. Photo: K. Bulla. Early 1900s [45]

Рис. 20. Прием рожениц у главного подъезда Александровского приюта для женщин. Фото: К. Булла. Начало 1900-х гг. [45]

Fig. 21. Details of the design of the end facade of the Alexandrovsky Women's Shelter building. Photo: S. Zakharenkova

Рис. 21. Детали оформления торцевого фасада здания Александровского женского приюта. Фото С. Захаренкова

Fig. 22. Inner courtyard of the Alexandrovsky Women's Shelter [47]

Рис. 22. Внутренний двор здания Александровского женского приюта [47]

Avenue, is dissected by three narrow crossbeams with complex gables, which sharpen the silhouette of the building. Previously, there was a row of pinnacles14 and an openwork parapet along the perimeter of the high roof (Fig. 19). The cornice is decorated with a row of dentils and an arcuate belt resembling machicolations. The courtyard facade features a wide avant-corps with a perspective portal on the basis of a lancet arch, ending with three triangular pinnacles[1] (Fig. 22). Outlines of niches and some windows refer to Gothic forms as they imitate lancet arches and trifolia[2]. The interior decoration was rather modest but functional.

The floors of the lobby, corridors and operating theatre were lined with Mettlach tiles. Stained glass windows were installed on staircase landings, in windows above the stairs and in a conference room. Particular attention should be paid to the stained glass window on the landing of the front staircase, which is a rare example of a genre scene in stained glass art of this time (Fig. 23). The painting depicts a young smiling woman in a white apron bathing an infant. The background ornament consists of alternating rosettes[3] [47].

The lower floor housed utility rooms, reception, kitchen, and washrooms. The latest technical innovations were used: the air ventilation device made it possible to completely change the air in the

[1] Pinnacle — a decorative turret or pyramid, completing a cornice, platband, etc.

[2] Trifolium — a symmetrical figure bounded by three identical circles, the centres of which are located in the vertices of an equilateral triangle.

[3] The stained glass windows in the conference room and staircase landing had similar ornamentation. A simple geometric grid of stained glass was also present in the narrower windows of the grand staircase, above the steps.

Fig. 23. Window of the main staircase made of colored glass with allegorical drawings

Рис. 23. Окно парадной лестницы из цветных стекол с аллегорическими рисунками[1]

whole building twice within an hour, each room had a device for regulating the heating temperature, a washbasin with cold and hot water, and electric lighting throughout the building. A special hoist bed on wheels was arranged for the weak and seriously ill who had no strength to climb the stairs. The first floor was occupied by the gynecological and septic wards, an operating room and an auditorium for lecturing to the female students of the midwifery school. The third floor was reserved for the maternity ward. There was also a pharmacy, a laboratory for chemical and microscopic investigations, richly equipped with devices, a linen department, a small hall where conferences were held and newborns were baptized. All the rooms for the sick were placed with windows facing south for better sunlight. The orphanage was arranged for 80 beds. The wards were designed for different numbers of patients, the paid ones could be provided to the poor without charge if necessary [2] [44, 48].

In 1918, the orphanage was renamed into the Wiedemann Maternity Hospital. Since 1973 it has been Maternity Hospital No. 1 of Vasileostrovsky District, and since 1999 the Pirogov Multidisciplinary Clinic has been opened in the building.

The Vyborg City Hospital (66 Bolshoy Sampsonievsky Ave., lit. B) is an interesting example of building conversion for health care needs. A two-floored rectangular building (Fig. 25) was constructed in 1899–1900 (Fig. 24). It was designed in the brick style by L.L. Peterson (1842–1902) for the Mechanical Spinning and Weaving School The brickwork imitates rustication on the entire surface of the walls. The large windows are decorated with a relief wedge or semi-circular lintel with imitation capstone, the windows of the first floor have “ears”, the floor division is emphasized by a continuous cornice, the crowning cornice is decorated with a belt of three-stage dentils. The central rizalit is highlighted by decorations: wide dentils, shaped niche, screens, two shaped turrets (Fig. 26).

In 1906, the building was purchased by the city public administration due to overcrowding of the city children’s hospital in honor of the Holy Coronation of Their Imperial Majesties.The newly-formed institution was named Vyborg Hospital and was originally intended to house typhoid patients. In 1906–1908, architect N.I. Postnikov (1880 — after 1931) rebuilt the main building and a one-floor wing, and repaired the dwelling house, laundry, janitor’s office, and chimney located on the territory of the hospital. An icehouse, a wooden barn, a chapel, an incinerator, a steam heating system, electric lighting from the children’s hospital and a sewerage system[3] were also constructed. In 1908, the roofs were repaired, a stable was built in a wooden barn, and a rest room was arranged. The hospital was equipped within a month and a half. The grand opening took place on 26 November 1906. The press emphasized that

[1] Central State Archive of Film, Photo and Sound Documents of St.Petersburg. Photodocuments. Op. 1E-4. Ed. chr. 3591.

[2] The treatment was free of charge for poor women. Those who wished to occupy the whole room paid 65 rubles for assistance during childbirth and a ten-day stay and 5 rubles per day for further time. They could keep a relative in the same room. Those who occupied only one bed in a separate room paid 40 rubles for the same time and 3 roubles per day for further stay, in common wards — 10 rubles and 1 ruble per day, if it was necessary to stay longer. It was emphasized that the attitude of the staff was the same for paid and free patients. The committee of the orphanage decided that the director and chief physician, three assistants and four midwives should always be at the orphanage in order to provide continuous medical care for the sick. The staff had their own quarters in the building.

[3] CSHA SPb. F 513. Op. 101. D. 194. L. 35–39.

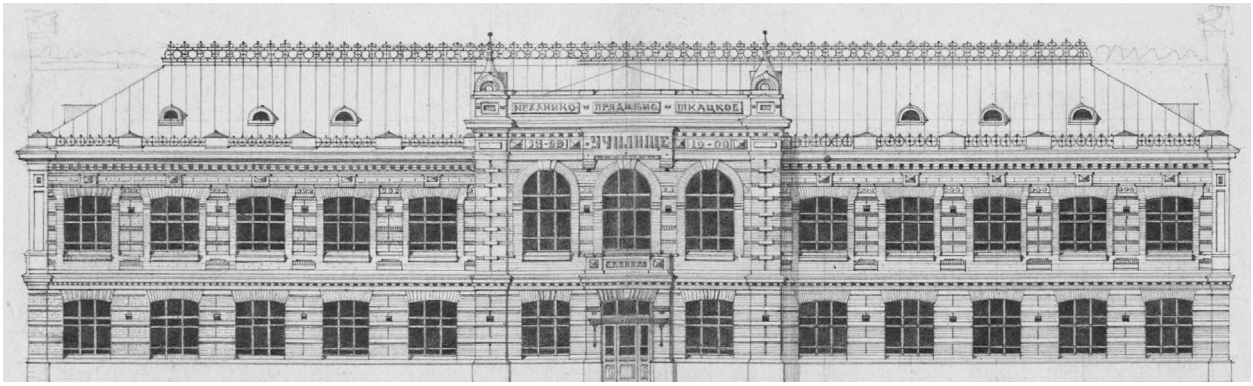

Fig. 24. Peterson L.L. Project of the Mechanical-Spinning-Weaving School on Sampsonievsky Prospekt in St. Petersburg. 1899 [49]

Рис. 24. Петерсон Л.Л. Проект Механико-прядильно-ткацкого училища по Сампсониевскому проспекту в Петербурге. 1899 г. [49]

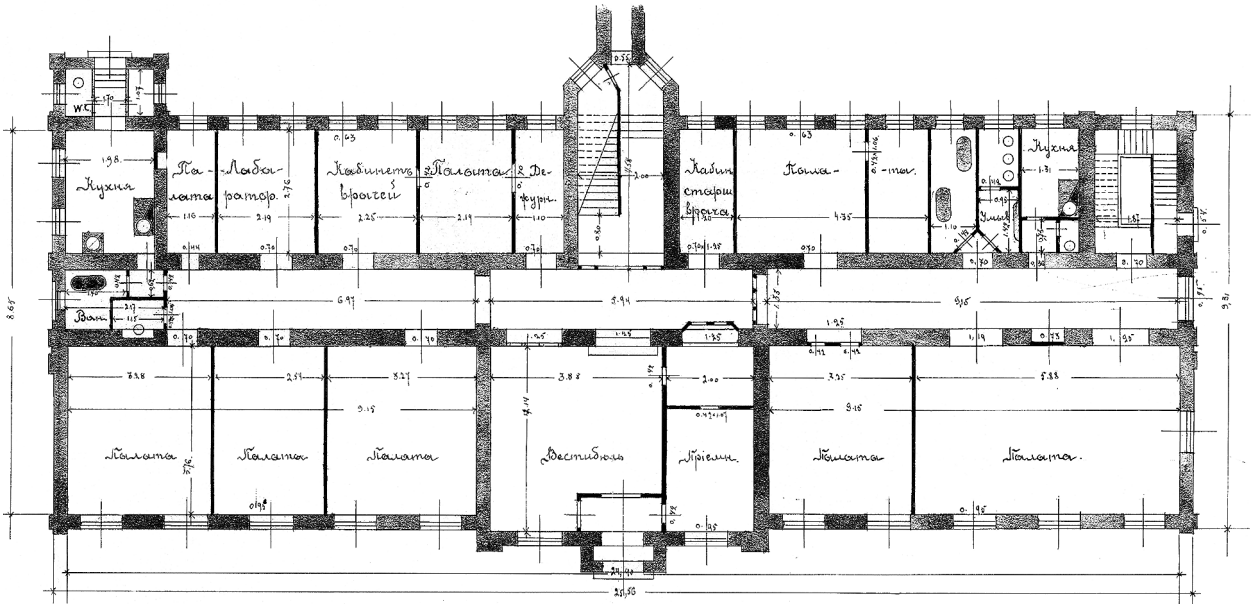

Fig. 25. Vyborg City Hospital. 1st floor plan

Рис. 25. Выборгская городская больница. План первого этажа[1]

the construction work, equipment and additions to the main building cost the city cheaply — about 250,000 rubles. The hospital could accommodate up to 350 patients [50]. In 1907 it was supposed to expand the hospital due to the overcrowding of city hospitals and the need to vacate them. The plans included the construction of two four-floor buildings on both sides of the main building: one would house rooms for 225 beds and a surgical department, the other — rooms for nurses, flats for assistants, 80 hospital beds; and a three-floor house for the middle administrative staff, surgeon and chief physician [51]. By 1910, the hospital had 300 regular beds: 163 beds for men and 137 — for women [52]. After the revolution the hospital building was transferred to the Karl Marx Mechanical Plant which adjoined its territory. Now it houses the Terra Nova group of companies.

The Ushakov Hospital (Stachek Ave., 34, lit. G), which was originally the All Saints' Land Hospital, is an example of a very modest use of the brick style decoration. The hospital was opened in 1875, it was located in a dacha donated by merchant A.M. Ushakov (1825–1917). The merchant renovated the building together with businessmen A. Shau and A. Grigoriev. Every year new buildings were erected: an icehouse, a

[1] CSHA SPb. F 513. Op. 101. D. 194. L. 9–10.

Fig. 26. Details of the facade of the Vyborg City Hospital building. Photo: V.I. Makeeva

Рис. 26. Детали фасада здания Городской Выборгской больницы. Фото: В.И. Макеева

bathhouse, a canteen, infectious barracks, a surgical department. In 1879 a garden was arranged on the territory, and in 1910 a stone building was built — the only surviving one from the whole complex [53, 54]. The building had three floors, L-shape and a minimum of decoration — only cornices, emphasizing the floor division, were decorated with dentils (Fig. 27). In the middle of the XX century the building was plastered with rustication and lost its appearance.

The All Saints Land Hospital was designed for 50 beds. Residents of St. Petersburg province, except for venereal and mental patients, were admitted to the hospital for treatment at full maintenance. Persons who did not pay the zemstvo fee were charged 9 rubles a month. A free outpatient clinic was organized, it provided medicines to the indigent [55]. In 1919 Putilov factory hospital was transferred to this building. In 1922 the hospital was named after V. Volodarsky, and in 1953 it was transferred to the restored building of the Kirov district preventorium. The main building housed a children's polyclinic. As a result of capital repairs in 2010, it moved to the building at 4/12 Gladkova Street. At the moment the reconstruction has not been completed.

The use of brick style in the architecture of St. Petersburg hospitals, together with other eclecticism trends, reflected the trend towards

Fig. 27. Hospital named after Volodarsky, 1920s. [17]

Рис. 27. Больница им. Володарского, 1920-е гг. [17]

rational architecture [3]. Brick-faced buildings were erected faster, cheaper and had greater durability. This made it possible to solve the problems of shortage of hospital facilities in a growing city with a rapidly growing population in a short time. Characteristic features of this period are active participation of doctors in the design of hospital complexes, which promoted the use of the latest achievements of medical science; the spread of a decentralized system of hospital construction, involving a clearer planning separation of hospital wards in the form of barracks and pavilions, which helped to minimize the spread of infections; the arrangement of ventilation systems; and the development of a new system of hospital buildings.

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.

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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UDC 615.471+616.34-006+614.253+93/94
DOI: 10.56871/MHCO.2024.51.82.010

RUSSIAN PRIORITY IN THE CREATION OF CIRCULAR STAPLING APPARATUS FOR RECTAL SURGERY: FROM “SPUTNIK” TO “RUSSIAN GUN”

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For citation: Tsarkov PV, Tulina IA, Krylova SV, Krylov NN. Russian priority in the creation of circular stapling apparatus for rectal surgery: from “sputnik” to “Russian gun”. Medicine and Health Care Organization. 2024;9(2):114–124. DOI: https://doi.org/10.56871/MHCO.2024.51.82.010

Received: 26.03.2024 ***Revised: 08.05.2024*** ***Accepted: 15.07.2024***

ABSTRACT. The requirements for the workmanship of the XXI century surgeon can be formulated by three main conditions: the ability to properly handle video (robot)-assisted equipment, safely use a variety of electrosurgical instruments and use all kinds of stitching devices for their intended purpose. One of the areas of modern surgery in which it is no longer possible to imagine the usage of a classic manual suture is a low colorectal anastomosis using a special stitching device in rectal cancer surgery. For the first time, a circular stitching device was developed for this purpose and used in the USSR. In the literature review, we traced the stages of the work of Russian engineers and surgeons from the creation of a circular stitching device for working on the main vessels — the “Soviet Sputnik in surgery” to the forthcoming of the “Russian gun” — a stapler for the colon suture with low anterior rectal resection in case of cancer. The key event for the introduction of the advanced scientific idea of Soviet engineers in the USA was the export of a domestic industrial design abroad by the American surgeon M. Ravitch. The great role of the famous British surgeons J. Goligher and R. Heald in the introduction of this technique around the world is emphasized. The article describes the background of the term “Russian gun”, the advantages and disadvantages of the first Soviet models of stitching devices, the stages of a gradual change in the negative attitude of foreign surgeons by introducing new modifications into widespread practice around the world, as well as the objective reasons for their replacement with American devices.

KEYWORDS: the history of medicine in the modern era of Russia, mechanical stitching devices

РОССИЙСКИЙ ПРИОРИТЕТ В СОЗДАНИИ ЦИРКУЛЯРНЫХ СШИВАЮЩИХ АППАРАТОВ В ХИРУРГИИ РАКА ПРЯМОЙ КИШКИ: ОТ «СПУТНИКА» ДО «RUSSIAN GUN»

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Для цитирования: Царьков П.В., Тулина И.А., Крылова С.В., Крылов Н.Н. Российский приоритет в создании циркулярных сшивающих аппаратов в хирургии рака прямой кишки: от «спутника» до «Russian gun» // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 114–124. DOI: https://doi.org/10.56871/MHCO.2024.51.82.010

Поступила: 26.03.2024 ***Одобрена: 08.05.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. Требования к искусству хирурга XXI века можно сформулировать тремя основными условиями: умение правильно обращаться с видео(робот)-ассистированной техникой, безопасно применять разнообразные электрохирургические инструменты и вместо ручного шва чаще использовать сшивающие аппараты. Одна из областей современной хирургии, в которой уже невозможно представить использование классического ручного шва, — это низкий колоректальный анастомоз с помощью специального сшивающего аппарата в хирургии рака прямой кишки. Впервые с этой целью циркулярный сшивающий аппарат разработали и применили в СССР. Мы проследили этапы работы русских инженеров и хирургов от создания циркулярного сшивающего аппарата для работы на магистральных сосудах — «советского искусственного спутника в хирургии» до появления «Russian gun» — степлера для шва толстой кишки при низкой передней резекции прямой кишки по поводу рака. Ключевым событием для внедрения передовой научной идеи советских инженеров в США стал вывоз за рубеж отечественного промышленного образца американским хирургом M. Ravitch. Подчеркнута большая роль знаменитых британских хирургов J. Goligher и R. Heald в распространении этой методики по всему миру. В статье описана история появления термина «russian gun», достоинства и недостатки первых советских моделей сшивающих аппаратов, этапы постепенной смены негативного отношения к ним зарубежных хирургов введением в широкую практику новых модификаций во всем мире, а также объективные причины их замены американскими девайсами.

КЛЮЧЕВЫЕ СЛОВА: история медицины в новейшую эпоху России, механические сшивающие аппараты

INTRODUCTION

If we try to compare the appearance, purpose, and usability of instruments for dividing, dissecting, and fixing operated organs and tissues, it will become clear that medical culture in different corners of the Oikumene has created convenient, practical, specialized devices, which are easily recognizable today, laconic and perfect as the surgeon's hand. These devices used to be a part from the arsenal of a clueless physician working in the volcanic ash-filled ancient Roman city of Pompeii (79 A.D.) [1], bizarre and refined equipment resembling the shape of exotic animals and birds, manipulated by the ancient Indian physician Sushruta (600 B.C.) [2], forceps, lancets and dilators of Persian encyclopedists Razes (X–XI c.) and Avicenna (X–XI c.), Europeans Ambroise Paré (XVI c.) and Jean Larrey (XVIII–XIX cc.), and a set of instruments of a surgeon of the early XIX c. from Munich (Kingdom of Bavaria) [3]. It is obvious that for a long time these sets of instruments did not change significantly with regard to their purpose, shape, size. Thus, they could be easily used in a dressing room of a modern outpatient clinic, provided that they were sterilized. In the second half of the XIX century it became possible to penetrate into the abdominal and thoracic cavities using knowledge of topographical anatomy, asepsis, antisepsis and general anesthesia. Subsequently, the devices were supplemented with new instruments allowing not only to stop bleeding and tie vessels, but also to cross parenchymatous, hollow and tubular organs, as well as to sew them after resection. They expanded capabilities of physician's fingers, although their availability and widespread use made it evident that the same medical instruments were used in different ways by physicians. The more a doctor knew and could do, the more specialized instruments he had, the greater his skill became. Surgery in the XIX and XX centuries rapidly became more and more complex. Surgeons penetrated into such hard-to-reach corners of the body, where it was increasingly difficult

to ensure proper exposure and illumination. The most critical stages — first of all, the formation of anastomosis (anastomosis) in the depth of the wound, with small sizes of the angle of inclination of the surgical action required from the surgeon delayed (or rare and shallow) breathing, slow heart rate (as in sniping), suppression of tremor of the fingers, scrupulous technique of possession of the needle holder and knotting surgical thread. During this period, the importance of individual and team manual skills, the ability to work in a team, honed to automaticity increased.

In the XX century, the frequency of suture divergence of colorectal anastomosis varied from less than 5% to more than 30% among different clinics and surgeons, which cannot be explained by differences in the clinical composition of patient groups and their concomitant diseases. It should have been related, among other things, to peculiarities of the surgeon's technical equipment, and the large scatter of indicators testify that doctors differed significantly in the level of their technical skills [4, 5].

The 20th century enriched surgery with three fundamentally different groups of new instruments: tools for endoscopic manipulations; electrosurgical and ultrasound instruments for tissue dissection and bleeding control; and perfect devices for automatic organ stitching. The first and the second minimize surgical trauma and blood loss, while the third unifies the technique of the most important stages of tissue matching surgery and standardizes its results. Today it is impossible to imagine an oncoproctological operating theatre that would not be equipped with a set of stapling devices (staplers) for various stages of radical surgery for rectal cancer.

The modern rectal suture stapler is ingenious in design and looks simple. However, it is important to pay close attention to the smallest details when using it in clinical practice in order to avoid device-related complications. It is correct both for modern conditions and at the dawn of its creation. The use of stapling devices does not diminish the rare, unique, exceptional, individual merits of a talented surgeon. But it allows raising the level of final results in a significant part of those who rarely (due to the place of their work and the level of their claims) perform technically complex, precision interventions.

The aim of the article is to introduce innovative works of Russian engineers and surgeons in the field of description of the device, test results and clinical application of domestic stapling devices, as well as to assert the Russian priority in the creation of in-demand medical equipment.

FROM SUTURING VESSELS TO GUT STAPLING

The first circular Soviet stapler, which had no analogues in the world, was a vascular stapler (VS) designed in 1945 by the inventor engineer Vasily Gudov. In 1948, V.P. Demikhov performed heart and lung transplantation into the chest of a dog using a circular VS in the USSR; after that Demikhov began to perform all experiments on organ transplantation only with the help of a stapler [6, 7]. The mechanical circular staple suture provided a number of important advantages over the manual Alexis Carrel suture: rapid formation of a standard, ideal in shape, strong and tight vascular anastomosis. At the same time, the quality of mechanical staple suture of blood vessels did not depend on the surgeon's skill.

In 1951, Gudov headed the Research Institute, which was established to develop techniques for automatic or semi-automatic stitching and suturing of organs in order to standardize and simplify surgical procedures and reduce the incidence of postoperative complications. Such devices were supposed to eliminate the correlation between treatment results and surgeon's individual manual skills and dexterity. In accordance with these tasks, the Institute established the following requirements to the device: simplicity of design, speed of application, reliability and non-traumatic mechanical suture.

Soviet vasostaplers were recognized abroad after P. Androsov demonstrated mechanical vascular suturing with VS to the surgical community at the 3rd Congress of the International Angiological Society in Atlantic City (USA) in October 1957. There was also shown a movie about the use of this device for heart transplantation in an experiment, it was filmed by Demikhov. The Soviet achievements looked so innovative and distinctive that they were called "Soviet surgical satellites" based on the analogy with the first artificial satellite recently launched in the USSR. It should be emphasized that the circular VS was successfully used for suturing other tubular hollow organs of small diameter, for example, the ureter, as well as the ends of the esophagus in case of atresia in newborns [8].

The first results of using a linear stapler for “end-to-end”, “side-to-side” and “end-to-side” interintestinal anastomosis in 10 patients (including the colon) were reported by T.V. Kalinina in 1958. [9]. The device was convenient to use; there were no difficulties during the formation of the interintestinal junction; the anastomosis turned out to be airtight in all cases; no postoperative complications were registered. The author believed that the use of the device is reasonable due to the following circumstances: there is no gaping of a lumen of joined ends of intestines, there is no infection of surgeon’s hands and an operating field with intestinal contents, crushing clamps are not applied to an intestinal wall, and suture placement rates are accelerated. Later, the SPN-7 device was created specifically for end-to-end esophageal anastomosis, which was inserted into the esophagus through the mouth [10]. In 1957, the GS (gut stapler) device for forming anastomosis to hollow organs of the gastrointestinal tract and LRS (lung root stapler) were designed, and in 1960, the GIAS (gastrointestinal anastomosis stapler) appeared. Both devices became prototypes of the whole family of modern staplers for thoracic and abdominal surgery.

In 1960–1961, a large line of Soviet staplers designed for use in various fields of surgery, including vessels, nerves, sternum, ribs, bronchus stump, gastrointestinal organs, and functioning arterial (Botall’s) duct were successfully presented in various clinics in the USA [11].

The first circular stapler designed specifically for the anastomosing of GI organs in the USSR was A.N. Burtsev’s device (model of 1957) [12]. In 1963–1966, PKS-25 apparatus was developed on the basis of this device, it was used to form esophageal-intestinal and esophageal-gastric joints, as well as other circular anastomoses [13]. In 1975, A. Burtsev reported on the clinical application of a device designed to create anastomosis on the rectum with two rows of mechanical sutures [14]. The IC (intestinal circular, further a Russian abbreviature KC is used) stapler became a further modification of this device, and then the universal stapler of gastrointestinal tract organs (USGIT) was created. It should be emphasized that the American company USSC produced the first original circular stapler CEEA (analog of the Soviet devices PKS-25, IC-28 and USGIT) only in 1977.

The KC apparatus for circular mechanical suture was created on the principle of the already known PKS-60 apparatus, but it differed by special parameters selected for anastomosis with rectum. Before clinical trials the characteristics of a single-row stapler anastomosis were studied (more than 100 experiments in total): leakage test, dynamics of staple rejection, peculiarities of anastomosis line healing, motor and evacuator function of distal colon sections in the presence of mechanical sutures. It turned out that the anastomosis without violation of tightness withstood the increase of intraintestinal pressure up to very high levels — 200–210 mm Hg. [15]. These results allowed further use of the KC suturer in 22 patients with rectal cancer and ulcerative colitis. The lethality amounted to 9.1%, but the causes of patients’ death were not related to the peculiarities of the operation.

T.V. Kalinina and V.S. Kasulin developed in a pilot trial and then applied (1965–1966) five variants of IC-28 device in clinical conditions, namely in 11 patients with rectal cancer. The outcomes of the device application were favorable in all cases. According to the authors, all techniques of colorectal anastomosis formation developed in the experiment justified themselves in practice, simplified and facilitated the operation [16]. A.N. Ryzhikh, the head of the proctology research laboratory and a clinic of the Ministry of Health of the Russian Federation, founded by him, started using the KC-28 from 1964, and from 1966 he operated on low rectal cancer exclusively with a circular stapler [17]. In 1967, he outlined his personal experience with 110 operations of anterior resection of the rectum (43 — by means of the stapler and 67 — with manual sutures).

The mortality rate was 4.7% after the operations with hardware suture, whereas it was twice as high with manual suture — 9.0%. In the late 1960s and early 1970s, the device IC-28 began to be used not only in Moscow, but also in many other cities of the USSR.

In 1971, the first article was published by Soviet surgeons outside the USSR. It was devoted to the results of using circular mechanical sutures in low sphincter-saving anterior resection of the rectum with a two-row colorectal circular anastomosis with metal staples [18]. It described the experience of more than 100 experimental operations and the results of treatment of 138 patients in the period from 1961 to 1969.

Obvious advantages of the stapler suture were noted: reliability, favorable healing of tissues in the area of the stapled intestines. The use of the apparatus greatly facilitated the work, making it faster (compared to conventional manual suture methods), especially in hard-to-reach areas of rectum sphincters. Healing of the intestinal wound was also more favorable. Functional results in the nearest and distant terms were satisfactory. The development of complications was noted in 3.6% of observations, lethality amounted to 0.7%. The results of the operations were traced for periods from six months to five years, and they corresponded to those in patients with manual anastomosis. By 1983, the USSR medical industry had already produced more than 40 samples of mechanical stapling devices for various fields of surgery.

SOUVENIR FROM RUSSIA

Mark Ravitch (1910–1989) is commonly referred to as the pioneer of surgical staplers. A more precise definition should be as follows: with the help of an industrial model of a linear stapler he brought from the USSR, relying on his unquestionable authority in the United States, he introduced Western medicine to the most advanced Soviet instrument for mechanical suturing of bronchus stumps at that time. In other words, he carried out industrial espionage. And then, under his leadership, this device was modified for various fields of surgery, their mass production was organized, which made such instruments available to surgeons all over the world.

In 1958, Ravitch, who had inherited his father's knowledge of the Russian language, gained respect and favor from Professor Nikolai Amosov, head of the Research Institute of Tuberculosis and Thoracic Surgery in Kiev (USSR), who showed him operated patients and their post-operative chest radiographs. On the radiographs Ravitch saw what struck him most of all: 3- and 4-inch double lines of thin white B-shaped metal brackets. N. Amosov explained that his institute had a special device for placing brackets on a bronchus stump and had already used them in about 200 lung resections and pulmonectomies. The next day Ravitch was admired by the extraordinary simplicity and efficiency of these unique instruments in Amosov's operating theatre and, of course, wanted to purchase them. However, all initial attempts to get a personal gift or make a purchase in Kiev were doomed to failure. Amosov categorically refused his request.

And only by chance (as he described), he bought a bronchial stapler for only 440 rubles ($110 at the 1958 exchange rate), it 33 cm long, weighed 640 g, and was placed in a birch wood box trimmed with black velvet. The stapler was purchased in the Medtekhnika shop in Leningrad. Ravitch himself ironically compared this success to an attempt made in 1939 by a foreign spy to smuggle a bazooka out of the United States [19]. So, returning to this allusion, we can assert that the great American surgeon made an effective attempt to pierce the iron curtain between Russia and the rest of the world with the help of the "Russian bazooka".

Upon his return to the USA, in 1959, M. Ravitch published an article on the use of the bronchus stapling instrument (BSI) in lung resection in experiment and clinic. He enthusiastically spoke about other stapling devices produced in the USSR. He was convinced that such staplers and their modifications will definitely find a permanent place in surgery [20]. The series of successful operations were continued in 1963, when he reported the immediate results of 139 lung resections with the help of the Soviet stapler: bronchial fistula was observed only in 3 (2.2%), and pleural empyema — in 3 cases (2.2%) [21].

Demonstrated capabilities of the Russian stapler were met with disbelief, although manual bronchial suturing required at least a dozen silk sutures and was ten times longer. "The instrument looks terribly big and heavy, and the art of suturing by hand is my vocation", sceptics replied to M. Ravitch. However, the main argument, which required scrupulous justification for many years, was the fact that an automatic instrument could do surgical manipulations not only fast, but also as well as its opponents, and probably even better [19].

Soon, the American businessman L. Hirsch founded the USSC company, which acquired licenses in the USSR for the production of stapling devices. The American analogues of the LRS apparatus were TA series staplers. GIAS was replaced by GIA series staplers, which entered clinical practice in the late 1960s. An important advantage of American staplers was the application of 4 rows of staple sutures (2 rows on the removed part and 2 rows on the left part of the organ). American models also allowed to leave a staple suture without peritonization, with

dosed bending of staples and compression of tissues without crushing them. These devices were equipped with plastic disposable cassettes, which were loaded with staples and sterilized at the manufacturing plant [21]. Further on, the paths of the Soviet and American inventors diverged, and in the following years they saw each other as competitors rather than like-minded people.

FIRST RESULTS OF SOVIET STAPLING DEVICES USE IN LOW ANTERIOR RECTAL RESECTION IN WESTERN COUNTRIES

The first US publication which presented a study on reliability of the Russian USGIT circular stapler in trials and clinical practice was issued in 1975 [22]. One of the authors (S.N. Fine) was the head of the oncological department of the Moscow Institute of Proctology from 1963 to 1973. Apparently, both clinical experience and the stapler itself were brought from the USSR. It was a circular stapling device using tantalum staples that was inserted through the anus to perform an end-to-end intra-abdominal mechanical anastomosis. The method was successfully applied in the USSR, first in experimental trials in 20 dogs and then in 165 human surgeries performed in Russia for carcinoma of the lower rectum from 1967 to 1972; the mortality rate was 2.4% and the incidence of mechanical suture failure was 3.6%.

In 1979 M. Ravitch and F. Steichen reported the successful use of hardware suture in an experiment at a distance of only 2 cm from the anus [23], which was the limit of the surgeon's possibilities to perform with the help of manual suture from the laparotomic access in the bowels of the small pelvis. The results of using the Russian circular suture device KC-28 in 50 patients were published in 1978 for the first time in Western Europe [24]. The authors reported 50 cases of inferior colorectal anastomosis performed for tumors located more than 4 cm above the anorectal fold. They verified that this technique does not compromise the closure function of the anus, reducing operative difficulties and not compromising oncological principles of treatment. The authors were surprised that postoperative complications were less frequent. The first publication on the use of the KC device in Eastern Europe (Hungary) was published in 1976 [25].

The work of D. Golikher et al became the most famous paper popularizing the technique from the USSR. [26]. The authors reported that in two years they were able to use the Soviet circular suture stapler USGIT in 62 patients. The authors concluded that the "Russian suture gun" provides reliable colorectal anastomoses that are at least as safe as those performed manually, and, in addition, it allows anastomosing the colon at a lower level, closer to the anal sphincter, which is impossible with the conventional manual suture technique. It turned out that the principles of the new technique described by M. Ravitch and D. Golicher were so important and simple that very soon they became a sort of obligatory reading for gastroenterology surgeons seeking competent handling of these instruments [27].

The attempt to introduce hardware suture into wide clinical practice in Europe initially met with indifference among specialists. Therefore, special publications by R. Held were required, in which he detailed the objective advantages of the new technology [28]. Initially, USGIT devices from the USSR and EA devices from the USA appeared in the UK as an alternative to manual anastomosis and, thus, did not arouse special interest among surgeons. However, soon it become apparent that the main value of staplers was the opportunity to create a secure anastomosis in the lower pelvis where safe manual anastomosis is difficult. This tool gave a surgeon the opportunity to redefine his surgical approaches and capabilities in rectal cancer.

EMERGENCE OF "RUSSIAN GUN"

The term "suture gun" was first used by D. Golicher in his publications to designate the Soviet circular stapling gun for colorectal surgeries, taking into account the appearance of the device, which resembles a short-barreled firearm. Right after him, R. Held uses the phrase "circular stapling gun" in the specialized literature. The term "Russian gun" was probably used in private conversations with colleagues and friends, most likely in a joking form. In the USA, the term "mechanical suturing apparatus" was usually used [29].

According to R. Held, D. Golicher showed him the "Russian gun" for the first time and encouraged him to think about using it in extremely low anterior resection of the rectum. It took another year to think, prepare and implement this

idea, when R. Held treated a 20-year-old recently divorced patient with a low tumor 5 cm from the anus. If a low anastomosis was not possible, she was facing the alternative of a permanent single-barrel colostomy (unnatural anus) on the anterior abdominal wall. But the "Russian gun fired", allowing the anal sphincter to be preserved [29]. Thus, namely R. Held was the first to perform both the case removal of the regional perirectal tissue with lymph nodes (TME — total mesorectal excision) and stapler anastomosis with a Soviet stapling device during low anterior resection for rectal cancer, which he invented in 1978.

Such successes stimulated interest in the "Soviet gun" by other surgeons. However, during a tour in England, a demonstration of new stapler's capabilities ended when the Russian gun malfunctioned during a demonstration operation. Therefore, "we all rejoiced," writes R. Held, "when the American company Autosuture began to produce disposable, more reliable instruments for stapling" [29].

INTEREST CAME TO REPLACE SKEPTICISM

However, publications in the USA, active educational work of R. Held in England (despite only one negative result), trips of Russian surgeons to European countries gave their results. There appeared interested responses and pioneer works in different Western countries. The so-called "Gun from USSR" and other brands of stapling devices began their triumphal march around the world. Belgium reported the use of Soviet devices PKS-28 and USGIT in 30 patients [30]. Polish oncologists reported the first favorable experience of using the PKC-25 instrument [31]. The new technique was adopted in Germany [32], Sweden [33], England [34], Italy [35], and Finland [36]. Irish surgeons, satisfied with the results of the first 30 operations, noted that gaining experience and a thorough familiarity with the technique resulted in fewer complications [37]. Hardware suture appeared in clinics and hospitals in other continents: in Africa (South Africa) [38], Australia [39] and South America (Brazil) [40].

Obviously, the pendulum of interest in new medical technologies gradually swung in the opposite direction: open rejection and latent indifference were replaced by interest, enthusiasm, passion, inspiration and encouragement. Many surgeons quickly jumped on a "foot of the train" to support its use [41]. R. Held and R. Lester expressed their belief that such operations could become one of the most striking and useful areas of progress in surgical technique, provided, of course, that the risks and dangers were recognized, considered, and mitigated [42].

F. Steichen and M. Ravitch considered that the Soviet instruments had following disadvantages: the necessity to precisely assemble the device during an operation after each preoperative sterilization, obligatory manual filling of the device cartridge with staples, formation of single-row sutures, and the absence of the instrument axis bend (repeating the bend of the rectum). However, the experiment showed that they could successfully perform extremely low rectal anastomoses [43].

However, if we compare the cost of the stapling device and rectal extirpation surgery with a permanent colostomy and lifelong care, the cost of using a stapler is lower than treating a patient after complete organ loss [44]. Hardware suture alone could not reduce the incidence of local tumor recurrence, but this could be achieved if low anterior resection was supplemented with TME (total mesorectumectomy), which created an objective justification for the widespread introduction of this method [45].

In the 1980s, it became clear to most coloproctologists that the use of new disposable American circular staplers saves a significant amount of time, primarily in forming a very low anastomosis. And the anastomosis itself can undoubtedly be performed with much greater ease compared to manual suturing [41].

Thus, the pioneer works of the Soviet Union in the field of tissue stitching and later Russian achievements in the creation of surgical instruments for solving a wide variety of problems pushed the world technologies to a number of improvements, which eventually made the methods of automatic stitching of organs and tissues a standard practice. For first 15–20 years (1966–1985) international experience of using first Soviet reusable stapling devices and then their American disposable modifications had been actively accumulated. It allowed to conclude that stapler colorectal anastomoses are at least as safe as those performed manually; the use of circular stapler allows to perform the reconstructive-restorative stage of low anterior rectal resection at lower levels (closer to the anus) than

in case of manual suturing. As a result, in the 1970s the rectum removal (total proctectomy as an alternative to resection which is concerned as disabling operation) became several times less frequent. The immediate results demonstrated that the use of the new technique in combination with TME did not lead to an increased incidence of local recurrence and decreased survival rate of patients after radical operations; low anterior resection with the formation of a hardware anastomosis became the operation of choice for almost all rectal lesions in which it is possible to safely preserve the sphincter [27], and hence the function of the rectum.

In 1988, R. Held emphasized that during rectal cancer surgery for rectal excision there was only one "high-tech" instrument in the hands of the doctor, which he could afford under these conditions — these were long sharp scissors. At the same time, only millimeters separate the surgeon from a wrong move, and he, like Odysseus — the hero of Homer's poem — can pass between Scylla and Charybdis: both radically remove the tumor with locoregional lymph nodes, without leaving tumor cells in the pelvis, and preserve the full function of urogenital organs without traumatizing their nerves [45].

Continuing R. Held's appeal to the images of Homer's great poem, let us remember that the last test of Odysseus (22nd song) was to draw his marvelous tight bow and release an arrow through the 12 rings set by Telemachus and not to touch a single one. Only then he could assert the right to regain his native island of Ithaca and his wife Penelope. When the operation ends, after the cutting and stitching mechanism of the "Russian gun" is triggered, the surgeon needs to receive only two complete intestinal "rings" (in Anglo-Saxon specialized literature the term "donut" is used), i.e. resected sections of the organs to be stitched together (proximal and distal ones). This is additional evidence in favor of the triumphant completion of tests, which have been finally passed by a modern coloproctologist-surgeon rather than by the hero of Homer.

The widespread use of the Soviet stapling device eventually leveled all the fluctuations of mastery of specialists from different countries of the world regarding the technique of interintestinal suture. An appeal to Samuel Colt's invention allows us to paraphrase it as follows: "God created different surgeons — strong and weak, 'Russian gun' made them equal". One of the most difficult anastomoses — low-lying colonic junction in rectal cancer surgery — has become equally reliable in the hands of a surgeon, regardless of his mastery of manual suture technique. However, it required mastering a new competence.

It is necessary to remember about the Russian priority in the world surgical gastroenterology — the creation of reusable circular stapling devices — since the loss of historical memory may lead to the loss of national identity.

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.

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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UDC 681.784.8+616.5-006.6/.81+614.2
DOI: 10.56871/MHCO.2024.44.67.011

MALIGNANT SKIN TUMORS SCREENING

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For citation: Gusarov MV, Barinova AN, Tayts BM, Zaslavsky DV. Malignant skin tumors screening. Medicine and Health Care Organization. 2024;9(2):125–134. DOI: https://doi.org/10.56871/MHCO.2024.44.67.011

Received: 30.04.2024 ***Revised: 27.05.2024*** ***Accepted: 15.07.2024***

ABSTRACT. Screening in medicine represents a major strategy for the early detection of certain diseases and risk factors, thereby facilitating timely intervention and potentially reduce the severity or mortality associated with these conditions. Numerous countries have established screening programs, aiming to provide health screenings and examinations availability for specific groups of the population. The efficacy of these screening initiatives depends on adherence to several key principles, including social significance of a particular disease, the potential treatment, the accessibility of diagnostic and therapeutic services, and the presence of reliable symptoms of a certain disease and diagnostic methods. The primary objective of screening is to diminish morbidity and mortality or to lessen the severity of a disease. Nonetheless, screening necessitates substantial investment and may present false-positive and false-negative results. Cutaneous melanoma, a malignant neoplasm originating from melanocytes (pigment-producing cells) of the skin, has demonstrated a fixed rise in morbidity and mortality rates in recent years. Skin cancer screening has been implemented in various countries being more or less successive. For instance, the SCREEN project conducted in Germany between 2003 and 2004 involved the screening of 360,288 individuals for malignant skin tumors. This initiative led to a notable reduction in melanoma mortality rates five years post-project. However, the introduction of nationwide screening in 2008 did not result in a decrease in melanoma mortality. Conversely, studies conducted at the Livermore Laboratory and in Australia resulted in various findings. The effectiveness of skin cancer screening and its association with melanoma morbidity and mortality continue to be subjects of academic debate. Nevertheless, identification and early treatment of patients with advanced melanoma, as well as targeting of those case that are most likely to progress, are crucial objectives of public healthcare. These efforts aim to reduce the incidence of advanced melanoma cases, thereby contributing to the broader goal of improving patients condition and the overall effectiveness of screening programs.

KEYWORDS: skin cancer screening, melanoma prevention, public health, skin cancer, melanoma diagnosis day, Euromelanoma

СКРИНИНГ ЗЛОКАЧЕСТВЕННЫХ НОВООБРАЗОВАНИЙ КОЖИ

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Для цитирования: Гусаров М.В., Баринова А.Н., Тайц Б.М., Заславский Д.В. Скрининг злокачественных новообразований кожи // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 125–134. DOI: https://doi.org/10.56871/MHCO.2024.44.67.011

Поступила: 30.04.2024 ***Одобрена: 27.05.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. Скрининг в медицине направлен на раннее выявление заболеваний и факторов риска их развития, что позволяет проводить лечение на начальных стадиях заболевания и снижать смертность. Во многих странах существуют программы скрининга, обеспечивающие доступ к медицинским осмотрам и обследованиям для определенных групп населения. Эффективность скрининга зависит от соответствия определенным принципам, включая социальную значимость заболевания, возможность лечения такого заболевания, доступность диагностики и лечения, существование характерных признаков болезни и методов ее выявления. Целью скрининга является снижение смертности и уменьшение тяжести течения болезни. Однако скрининг требует значительных инвестиций и может приводить к ложноположительным и ложноотрицательным результатам. Меланома кожи — злокачественная опухоль нейроэктодермального происхождения, исходящая из меланоцитов (пигментных клеток) кожи, с растущими на протяжении последних лет заболеваемостью и смертностью. Скрининг рака кожи осуществлялся в разных странах с разной эффективностью. В 2003–2004 гг. в Германии проводился проект SCREEN по диагностике злокачественных новообразований кожи. В скрининге приняло участие 360 288 человек. Снижение смертности от меланомы наблюдалось через 5 лет после проекта. Однако, после введения общенационального скрининга в 2008 г., смертность от меланомы не снизилась. В других исследованиях, таких как в Ливерморской лаборатории и в Австралии, скрининг привел к различным результатам. В целом эффективность скрининга рака кожи и его влияние на заболеваемость и смертность от меланомы остаются предметом дискуссий. Тем не менее сокращение числа пациентов с поздней стадией меланомы, выявление пациентов с наибольшей вероятностью прогрессирования и лечение этих пациентов на самой ранней стадии являются важными задачами общественного здравоохранения.

КЛЮЧЕВЫЕ СЛОВА: скрининг рака кожи, профилактика меланомы, общественное здравоохранение, рак кожи, день диагностики меланомы, Евромеланома

Medical screening is a strategy used to search for diseases or risk markers that have not been recognized yet. In addition, screening interventions are designed to identify conditions that are likely to develop into disease in future, thereby allowing earlier treatment and hopefully reducing mortality and suffering from the disease. In many countries, screening programs are part of public health care [1].

Thus, according to Order No. 404n, issued by the Ministry of Health of Russia on April 27, 2021, "On Approval of the Procedure for Preventive Medical Examination and Regular Medical Screening of Certain Groups of the Adult Population" [2], there is a system of medical screening in Russia. [2]. According to this system, every person aged 18 and over has the right to undergo a medical check-up by specialist and a number of medical examinations to detect chronic non-communicable diseases and risk factors for their development, such as diseases of the circulatory system, cancer, respiratory diseases, and diabetes mellitus.

The UK has an NHS Health Check program that suggests adults aged 40 to 74 years to have a health check every five years to reduce the likelihood of acute coronary syndrome, stroke or developing some forms of dementia [3].

Certain principles must be followed for screening to be effective. Such principles were formulated by James Wilson and Gunnar Jungner.

1. The disease should be an important medical problem.
2. There must be a treatment for the disease.
3. Diagnosis and treatment for the disease should be available.
4. The latent or early symptomatic phase should have characteristic features.
5. There should be a method to detect the disease.
6. The test must be acceptable to the population.
7. An adequate understanding of the natural course of the disease is required, including its progression from latent to overt manifestation of disease.
8. There should be a harmonized policy in the need for treatment.
9. The economic costs of case detection should be balanced against the total costs of the disease.
10. The process of case detection should be continuous [1].

Screening programs exist for a range of conditions. The purpose of each program should be clearly stated and understood. This is necessary to form the structure of the program and to conduct an evaluation of its effectiveness.

The goals of a screening program may include:

- reducing mortality through early detection and early treatment of disease;
- reducing morbidity through detection and treatment of disease precursors;
- reducing the severity of the disease course by identifying people with the disease early and providing effective treatment;
- expanding the choice of treatment tactics by detecting pathologic conditions or risk factors in early life, when choosing the methods of its implementation is available [1].

When mass screening is carried out, a significant number of participants are subject to medical examination. This requires significant investment in equipment, personnel and information technology, which can result in a significant additional burden on the health system. Thus, when deciding to implement screening programs, it is necessary to understand the strength of the evidence base for such screening and the balance of "harms and benefits" in order to count necessary costs and positive outcomes [1].

In addition to the benefits for patients and public health, screening carries some risks, such as false-positive results. For example, some women with false-positive mammograms have increased anxiety compared with women with normal results and are therefore less likely to undergo repeat screening procedures [4].

In addition, false-negative results are also possible, leading to an unwarranted sense of security in patients, ignoring important symptoms and not receiving timely treatment, which worsens the prognosis of the disease [5].

Screening does not always prove to be sufficiently effective. For example, a Cochrane review found that health checks had little or no convincing effect on overall mortality and mortality from cardiovascular disease, including coronary heart disease and acute stroke [6].

Screening for the same disease may be differentially effective in various groups. For example, breast cancer screening every two years is recommended for women aged 50–69 years, once a year for younger women, and longer screening intervals are recommended for women aged 70–74 years [7].

In the Schleswig-Holstein region of northern Germany implemented a SCREEN project for the diagnosis of skin malignancies from 2003 to 2004. Screening took place in two stages; in the first stage, skin examinations were performed by physicians with no specialized training in dermatology. If risk factors or suspicious neoplasms were identified, patients were referred to a dermatologist. Some patients were immediately referred to a dermatologist for evaluation. If a suspicious neoplasm was identified, a biopsy was performed by the dermatologist to confirm the diagnosis and, if necessary, treatment was prescribed. A total of 360,288 people participated in the screening, 15,983 excisional biopsies were performed and 3103 malignant tumors were detected in 2911 people, of which 585 melanomas (1.6 per 1000 screened), 1961 basaliomas (5.4/1000), 392 squamous cell carcinomas (1.1/1000) and 165 other malignant tumors (0.5/1000) were found. An average of about 5 excisions was performed to detect one malignant tumor.

Among 1.88 million eligible citizens, 360,288 participated in the SCREEN program. The overall population participation rate was

19%. Five years after SCREEN, there was a significant decrease in melanoma mortality (men: 0.79/100,000, expected rate of 2.00/100,000; women: 0.66/100,000, expected rate of 1.30/100,000) [8].

A more recent study compared SCREEN screening results with morbidity and mortality rates in the population of the Saarland region, where no screening was performed. Over a 5.5-year period, 1472 SCREEN participants were diagnosed with melanoma and 31 of them died during this period. A comparison showed that in the Saarland region with a population of about one million inhabitants, 1,026 people were diagnosed with melanoma and 111 of them died from it, indicating a lower mortality rate in the SCREEN cohort [9].

At the same time, other authors note that the observed decrease in mortality in Schleswig-Holstein 5 years after the pilot study was accompanied by an increase in the number of deaths from malignant neoplasms of non-specified localizations and secondary malignant neoplasms of non-specified localizations (ICD-10 code C76-C80). Therefore, from their point of view, incorrect assignment of causes of death caused by melanoma as ICD-10 code C76-C80 between 2007 and 2010 may have influenced the temporary decrease in skin melanoma mortality rates observed in Schleswig-Holstein [10].

A pilot project in the Schleswig-Holstein region resulted in nationwide screening organized in Germany in 2008. Every person over the age of 35 was offered a whole-body screening once every two years. By 2013, there was no downward trend in melanoma mortality in Germany since the nationwide screening had been introduced. As for the pilot study area in the Schleswig-Holstein region, melanoma mortality rates returned to pre-screening rates and were equal to average German rates. The authors attribute the lack of the desired result to lower quality of screenings, lower population coverage, and difficulties in data collection in comparison with the pilot study [11].

A training and screening program at the E. Lawrence Livermore National Laboratory took place from 1984 to 1996. Employees were informed about sun protection, signs and risk factors for melanoma. This information was disseminated through direct mailings, news articles at workplaces, meetings and lectures to employees and local physicians, and local media outlets also ran articles about the program. Employees were asked to examine themselves for suspicious lesions. If the self-examination revealed a suspicious neoplasm, a visit to the screening facility for a full body examination, dermatoscopy, and biopsy, was suggested. Alternatively, laboratory workers could be seen by their personal physicians. In this case, employees were asked to report the results to the laboratory medical staff. All employees were also given a form to report the number of their moles at the beginning of the program, and laboratories were subsequently given the same form. Program participants who counted 5 or more moles that were 5 mm or more in diameter or one mole that was 18 mm or more in diameter were offered a screening examination.

After dermatologic screening, employees with melanoma (invasive or *in situ*), dysplastic nevi, 50 or more moles, or a family history of melanoma were offered periodic whole-body screening every 3 to 24 months, often with whole-body photography and dermatoscopy, according to melanoma risk level.

The overall incidence of melanomas thicker than 0.75 mm decreased from 22.1 to 4.62 cases per 100,000 person-years. The overall incidence of melanoma less than 0.75 mm increased and then decreased slightly without a significant linear trend, and the overall incidence of melanoma *in situ* increased significantly. There were no melanoma deaths among employees during the screening period, whereas the expected number of deaths was calculated to be 3.39 deaths. The statistically significant reduction in mortality was maintained for at least 3 years after employees retired or otherwise left the laboratory [12].

Another study reported that intensive public awareness in Central Texas did not reduce the incidence of melanoma or detect the tumor at an earlier stage [13].

A population-based case-control study was conducted among Queenslanders in Australia. Patients aged 20–75 years with histologically confirmed primary invasive melanoma of the skin diagnosed between January 2000 and December 2003 were interviewed. The results of the survey showed that a whole-body clinical skin examination which had been performed three years before the diagnosis provided a 14% reduction in the risk of melanoma thicker

than 0.75 mm (by Breslau), 7% — for 0.76–1.49 mm, 17% — for 1.50–2.99 mm, and a 40% reduction for melanomas ≥3 mm. The possibility of diagnosing melanoma with a thickness ≤0.75 mm by Breslau increased up to 38% [14].

A number of authors have noted that at present there is not enough information to make a decision on population-based screening of the Australian population. Integration of risk-based population stratification and more accurate diagnostic tests is likely to improve the benefit-harm balance of opportunistic screening [15].

An evaluation of a general practitioner training campaign was carried out in the Champagne-Ardenne geographical region of France, which has a population of 1.34 million. In 2008, all GPs were mailed repeatedly and 398 (32.1%) attended training sessions organized by dermatologists. The effectiveness of the campaign was evaluated in comparison with the Du/Belfort area, where a similar campaign was not conducted. As a result, the incidence of melanomas >3 mm by Breslau decreased from 1.07 to 0.71 per 100,000 inhabitants per year, the mean thickness of diagnosed melanomas decreased from 1.95 to 1.68 mm by Breslau, and the proportion of melanomas >3 mm by Breslau decreased from 19.2% to 12.8%. The proportion of melanomas <0.75 mm thick by Breslau and *in situ* melanomas increased from 50.9% to 57.4% and from 20.1% to 28.2%, respectively. No significant changes were observed in the Du/Belfor area. These results confirm the effectiveness of the campaign aimed at raising awareness among general practitioners [16].

A systematic review on skin cancer screening and secondary prevention campaigns conducted a search for studies published in English or German between January 1, 2005 and February 4, 2015. Fifteen articles were included in the study. Overall, the data showed that the incidence of in situ and invasive skin cancer increased with the introduction of skin cancer screening. There was an increase in thin melanoma rates and a decrease in thick melanoma rates. After screening was discontinued, the incidence of invasive melanoma decreased. A German study showed a significant reduction in melanoma mortality; 2 other studies showed fewer deaths than expected. However, the authors note the low level of evidence of the studies [17].

The US Preventive Services Task Force (USPSTF) believes that the available evidence is insufficient to assess the balance of "benefits and harms" of visual inspection of the skin by a physician for skin cancer screening in adults [18].

A Cochrane review on screening aimed to reduce melanoma morbidity and mortality evaluated two studies with a total of 64,391 subjects. The data analysis concluded that screening to reduce melanoma morbidity and mortality did not meet the criteria for making it population-based. However, this review did not examine the effects of screening people with a history of melanoma or people with a genetic predisposition to melanoma [19].

The Cancer Council Australia recommends complete skin screening with dermatoscopy and whole-body photography for patients at very high risk of melanoma to detect new cases of melanoma at an earlier stage, and Australian evidence suggests that such screening is cost-effective [20].

Euromelanoma is a pan-European skin cancer prevention campaign that aims to provide the public with information on the prevention, early diagnosis and treatment of skin cancer. The campaign is mainly dedicated to promote primary and secondary prevention of skin cancer and in particular melanoma in Europe. The ultimate goal is to reduce melanoma morbidity and mortality. Euromelanoma has been conducted by European dermatologists since 1999 and is a free for population. The campaign is promoted through public service announcements and media advertising, as well as educational events on the risk factors for the disease, the warning signs of skin cancer, the dangers of excessive sun exposure and optimal photoprotection methods.

The campaign uses a variety of public relations tools to raise awareness and information about skin cancer, ranging from brochures and posters to media advertisements, and utilizes the online platform http://www.euromelanoma.org with information in different languages [21].

The results of the Euromelanoma campaign were evaluated in Belgium. Researchers did not observe an increase in melanoma incidence after the start of the campaign. However, they

note that primary prevention, focusing on etiologic factors, and informing the population about risk factors are important, but the result should not be expected in the coming years, which is due to the long period between exposure to a risk factor and the development of the disease [22].

Another Belgium research evaluated the effects of an information and screening campaign. The campaign "Be prudent in the sun", aimed at taking appropriate precautions to prevent melanomas. It included the production and distribution of informational material on sun protection and lectures in various municipalities targeting the general population. Similarly to other European countries, the city of Limburg (Belgium) has hosted "Melanoma Monday" since 1999, which is organized every year in the first half of May. The annual number of participating patients is between 4000 and 5000. In ten years, the cancer registry has recorded 735 melanomas, 271 in men and 464 in women, representing 6.8/100,000 patient-years in men and 11.6/100,000 patient-years in women. The authors note that the study was not intended to and could not measure the effect of a sun protection awareness campaign, as this can only be evaluated on a long-term basis. This study found a small effect of the campaign on melanoma incidence in men (there was no effect in women), and there was no effect of the campaign on the distribution of tumor stages. This impact was aimed at the general population. The authors suggested that the effectiveness of skin cancer screening may be higher if it targets only those at high risk of melanoma [23].

The 2013 skin cancer screening program was evaluated in Switzerland. It was concluded that the overall melanoma detection rate was comparable to similar interventions in Europe. The authors believe that the cost of free screening programs compares favorably with the avoided potential therapeutic costs of advanced melanoma [24].

Another study analyzed the results of Euromelanoma 2016 in Switzerland. The participating physicians examined 2795 individuals. A total of 2215 (79.3%) of the examined individuals did not require further treatment. Suspicious neoplasms were found in 580 (20.7%) patients. Among them, 243 (41.9%) patients did not agree to a follow-up survey for quality assessment after 3–6 months and were not included in the study. 337 were willing to participate in the study, 140 (41.5%) of them were unavailable either due to incorrect contact details or non-response. 197 people remained, 40 (20.3%) of the remaining patients stated that they did not fulfill their physician's recommendation to see a dermatologist. The remaining 157 (79.7%) participants had a follow-up examination with a dermatologist. It was reported that a total of 81 out of 157 cases of suspicious neoplasms were biopsied. Among these 157 cases, 6 melanomas, 21 basal cell carcinomas, 2 squamous cell carcinomas, 44 actinic keratoses, and 3 dysplastic/atypical nevi were found. In 74 cases there were no pathologic changes characteristic of malignancy (41 of 74 biopsies), and in 7 cases the diagnosis was not reported. The frequency of detection of melanoma was 1:466 and basal cell carcinoma was 1:133. The detection rate of squamous cell skin cancer was the lowest at 1:1398. The results are mostly in line with other European studies [25].

After a decade of annual campaigns (2000–2010), an attempt was made to evaluate the actual impact of Euromelanoma on skin cancer prevention and education activities in Europe. National Euromelanoma coordinators were asked to participate in a survey to assess the impact of the campaign on public attitudes and medical interventions in relation to the disease, as well as on national skin cancer prevention efforts. This survey received responses from 21 representatives from 27 countries, reporting approximately 260,000 screening examinations since the start of the campaign. The most frequently cited challenges were the difficulty in reaching high-risk groups through screening and maintaining the continued interest of dermatologists to participate in the campaign over the years. Nevertheless, respondents agreed with the success of the Euromelanoma campaign in raising public awareness of skin cancer risk and prevention, in strengthening the role of dermatologists in the detection and treatment of skin cancer, and in stimulating media involvement in education and prevention [26].

Similar studies have been conducted in Russia. A total of 3143 patients over 18 years of age from Samara, Chelyabinsk, Yekaterinburg, and Krasnodar were examined for skin neoplasms. Three patients were found to have skin melanoma, 15 had basal cell carcinoma, and 1 had Bowen's disease [27].

Another study examined the Melanoma Screening Day 2021 questionnaire database which contained 8003 participants. It evaluated the division of patient flow in skin malignancy screening based on risk groups. There were detected 157 melanomas in 140 patients, 98 basalomas in 81 patients, and 6 squamous cell carcinomas in 6 patients. Significant differences in the incidence of malignant skin neoplasms were found in the low- and medium-high-risk groups ($p < 0.05$). When comparing the low and medium-low risk groups and the medium-low and medium-high risk groups of malignant skin neoplasms, reliable differences were also found ($p=0.009$). Statistically significant higher frequency of morphologic confirmation of skin malignancies was revealed during a separate specialist appointment compared to a regular dermatologic appointment: among the identified skin malignancies during a separate appointment by a separate dermatologist, 55.11% were confirmed; among those identified during a regular dermatologic appointment, 4.35% of cases were confirmed ($p < 0.001$).

462 people, including 372 women (80.5%) and 87 men (18.8%) aged 20 to 72 years (three respondents did not indicate their gender (0.7%)) were interviewed to assess the level of professional training of doctors providing specialized dermatovenerological care to patients who need screening for malignant skin neoplasms. Among the respondents, 79 were dermatovenerologists (17.1%), 14 were oncologists (3.0%), and 184 were doctors of other specialties (39.8%). The control group of people without higher medical education (181 people (39.2%)) was selected for comparison, four respondents did not indicate their education (0.9%). The median of correct answers amounted to 16 out of 22 (72.7%). Only 4 people out of 462 (0.9%) answered all questions correctly. Dermatovenerologists and oncologists answered the questions statistically significantly better than doctors of other specialties and respondents of the control group [28].

A set of organizational measures was proposed in order to improve the screening of malignant skin neoplasms: continuity of medical screening; division of patients into risk groups; introduction of a separate specialist for the screening of malignant skin neoplasms in the staff of a skin and venereological dispensary; increasing the knowledge of screening of malignant skin neoplasms among doctors of other specialties in outpatient health care [29, 30].

A review of scientific publications allows us to identify generally recognized approaches to screening for early detection of malignant skin neoplasms and to conduct educational campaigns to train medical personnel and inform the population, despite the diversity of research results obtained in different countries of the world.

The need for screening in medium- and high-risk groups has an evidence base; this work should be carried out on an ongoing basis.

The use of a complete skin examination by means of dermatoscopy and, if necessary, whole-body photography for patients at high risk of melanoma to detect new cases at an earlier stage is cost-effective and efficient.

Involvement of dermatologists to examine patients with suspected skin neoplasms ensures timely qualified therapeutic and diagnostic care with the best results.

In order to raise public awareness, it is necessary: to conduct sanitary and educational work, as well as to involve mass media on skin cancer prevention; to inform the population about the need for screening in outpatient settings.

Since 2007 “Melanoma Diagnostics Day” has been annually held in Russia. Taking into account the morbidity, mortality, financial and social consequences of skin cancer, such all-Russian screening day has an important impact on the public health system, as it raises awareness of participants about risk factors, methods of skin cancer prevention, which, according to the survey conducted, is an urgent problem for doctors of various specialties.

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.

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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UDC 371.122.1+378.6+614.88+37.031.2
DOI: 10.56871/MHCO.2024.90.86.012

"MULTIDISCIPLINARY APPROACH IN EMERGENCY AND URGENT MEDICINE" — CONFERENCE DEDICATED TO THE 220th ANNIVERSARY OF THE CITY MARIINSKY HOSPITAL

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For citation: Reutsky IA, Zavrazhnov AA, Shcheglova LV, Artyukh LYu, Orel VI, Kirichenko IYa, Erina MYu, Andreenko AA. "Multidisciplinary approach in emergency and urgent medicine" — conference dedicated to the 220th anniversary of the City Mariinsky Hospital. Medicine and Health Care Organization. 2024;9(2):135–145. DOI: https://doi.org/10.56871/MHCO.2024.90.86.012

Received: 15.05.2024 ***Revised: 13.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. In 2023, the City Mariinsky Hospital celebrated its 220th anniversary. In honor of the anniversary, a series of commemorative events were held at the hospital — the opening of the restored Temple of St. Apostle Paul, a ceremonial shot from the Naryshkin Bastion of the Peter and Paul Fortress, a solemn gathering and concert at the Mariinsky Theatre, the unveiling of a monument to Prince P.G. Oldenburg, and a scientific-practical conference "Multidisciplinary Approach in Emergency and Urgent Medicine". This publication is focused on the conference held on December 8, 2023, its preparation, 8 sectional sessions, more than 70 scientific reports, lively discussions, exchange of experiences and opinions, scientific and museum exhibition, and of course the participants (over 650 specialists from St. Petersburg and regions of Russia). The idea of organizing scientific-practical conferences at the Mariinsky Hospital is not innovative; similar events are regularly held by the institution authorities and are part of its century-old traditions. The educational goal of this event was take the conference audience through modern trends, technologies, methodologies, and research results based on a multidisciplinary approach in emergency and urgent medicine. Two master classes: "Bedside Ultrasound Evaluation of Patients in Critical Condition in a Multi-profile Emergency Medical Station" and "Algorithms for the Safe Use of Electrosurgical Equipment", were held at the hospital site and preceded the conference. In general, the multidisciplinary experience of providing medical care presented at the conference sessions and reported in this publication, has proven to be of great importance not only for the healthcare system of the city of St. Petersburg but can also be effective for the entire healthcare system of the Russian Federation.

KEYWORDS: Mariinsky Hospital, 220th anniversary, conference, multidisciplinary approach, emergency medicine

«МУЛЬТИДИСЦИПЛИНАРНЫЙ ПОДХОД В ЭКСТРЕННОЙ И НЕОТЛОЖНОЙ МЕДИЦИНЕ» — КОНФЕРЕНЦИЯ, ПОСВЯЩЕННАЯ 220-ЛЕТИЮ ГОРОДСКОЙ МАРИИНСКОЙ БОЛЬНИЦЫ

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Для цитирования: Реутский И.А., Завражнов А.А., Щеглова Л.В., Артюх Л.Ю., Орел В.И., Кириченко И.Я., Ерина М.Ю., Андреенко А.А. «Мультидисциплинарный подход в экстренной и неотложной медицине» — конференция, посвященная 220-летию Городской Мариинской больницы // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 135–145. DOI: https://doi.org/10.56871/MHCO.2024.90.86.012

Поступила: 15.05.2024 ***Одобрена: 13.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. В 2023 году Городская Мариинская больница отметила свой 220-летний юбилей. В честь юбилея больницей проведен ряд памятных мероприятий — открытие восстановленного Храма святого апостола Павла, торжественный выстрел с Нарышкинского бастиона Петропавловской крепости, торжественное собрание и концерт в Мариинском театре, открытие памятника принцу П.Г. Ольденбургскому, а также проведена научно-практическая конференция «Мультидисциплинарный подход в экстренной и неотложной медицине». В данной публикации пойдет речь о проведенной 8 декабря 2023 года конференции, ее подготовке, 8 секционных заседаниях, более 70 научных докладах, живых дискуссиях, обмене опытом и мнениями, научной и музейной выставке и, конечно, участниках (свыше 650 специалистов Санкт-Петербурга и регионов России). Идея проведения научно-практических конференций в Мариинской больнице не нова, подобные мероприятия проводятся учреждением на регулярной основе и представляют собой одну из вековых традиций учреждения. Образовательной целью данного мероприятия явилось ознакомление аудитории конференции с современными тенденциями, технологиями, методиками и результатами научных исследований на основе мультидисциплинарного подхода в экстренной и неотложной медицине. Предшествовали конференции два мастер-класса, проведенных на территории больницы, — «Прикроватная УЗ-оценка пациентов в критическом состоянии в многопрофильном стационаре скорой медицинской помощи» и «Алгоритмы безопасного использования электрохирургического оборудования». В целом освещаемый в данной публикации мультидисциплинарный опыт оказания медицинской помощи, представленный на полях конференции, имеет большое значение не только для всей системы здравоохранения города Санкт-Петербурга, но и для России в целом.

КЛЮЧЕВЫЕ СЛОВА: Мариинская больница, 220-летний юбилей, конференция, мультидисциплинарный подход, экстренная и неотложная медицина

In 2023, the City Mariinsky Hospital celebrated 220th anniversary, while St. Petersburg celebrated 320th birthday. The initiator of the hospital's establishment and head during the first 25 years of functioning was the Dowager Empress Maria Fyodorovna, wife of Paul I. The hospital was presented by the imperial family to the city in honor of its 100th anniversary, and the Empress invited the talented architect Giacomo Quarenghi to build the hospital facilities [1, 2].

On May 28, 1803 the construction of the hospital began with laying of the foundation stone of the Church of St. Paul the Apostle, which became the first St. Petersburg hospital temple. According to the plan of Empress Maria Fyodorovna, it should have become the central part of the hospital, its "heart", because the merciful service to the sick should have a truly spiritual basis. All buildings of the hospital were finally finished and opened in

Spring 1805, and it was named “Hospital for the Poor”.

The Empress Maria Feodorovna’s directly participated in all affairs of the hospital and made it an exemplary hospital, not only among Russian but also among foreign clinics. After the death of the Empress in 1828 the hospital was renamed and became known as the “Mariinsky Hospital for the Poor” [3, 4].

From 1839 to 1881 the hospital was managed by Prince Peter Georgievich Oldenburgsky, grandson of Emperor Paul I and Maria Feodorovna. Under his leadership, the hospital underwent great changes: stone buildings of the prosecutor’s office, a new two-floor laundry building, the Alexandrinsky Hospital building, and a two-story stone house were built to accommodate patients during the summer months, as well as in case of any epidemics at any time of the year. He personally developed and purchased the most advanced medical equipment for that time.

Prince P.G. Oldenburgsky ran the hospital for more than 40 years, and after his death there was a solemn opening of a monument with the participation of the entire august family in front of the hospital building. Unfortunately, in the 30s of the XX century the monument was lost.

It is noteworthy that for all these 220 years, not a single episode such as epidemics, wars, rand evolutions, has passed over hospital walls. The hospital was located in the center of the city and was the first to provide aid to the sick and wounded. Many of its employees traveled to the theater of war, the elimination of epidemics, and various expeditions. Outstanding medical scientists worked here, their works made a huge contribution to domestic and world medical science [5, 6].

In 1918, the Mariinsky Hospital for the Poor was named “Hospital in Memory of Victims of the Revolution”, in the same year the hospital church was closed. In 1935 the clinic was given the name of the revolutionary V. V. Kuibyshev. And finally, on June 17, 1992, the hospital was returned to its historical name — “City Mariinsky Hospital”.

At present the City Mariinsky Hospital is a modern multidisciplinary hospital with 1030 beds, working in the system of rendering mainly emergency medical aid to the city population. 13 buildings and facilities of the hospital are located in the historical center of St. Petersburg on the territory of 5.02 hectares, where clinical and therapeutic-diagnostic divisions are located. Today the hospital employs more than 2,500 people [7–10].

A number of commemorative events were held in honor of the 220th anniversary of the hospital:

Fig. 1. Church of the First-Born Apostle Paul after restoration, 2023

Рис. 1. Храм Первоверховного Апостола Павла после реставрации, 2023 год

- on June 7, 2023, the rebuilt Church of St. Paul the Apostle was opened (Fig. 1), a ceremonial shot was fired from the Naryshkin Bastion of the Peter and Paul Fortress, and a solemn meeting and concert were held at the Mariinsky Theater;
- on August 9, 2023, a monument to Prince P.G. Oldenburgsky was unveiled (Fig. 2) in the presence of members of the imperial family, his grandson Gounod von Oldenburgsky, his wife and children.
- on December 8, 2023, the Scientific and Practical Conference “Multidisciplinary Approach in Emergency and Urgent Medicine” was held; its initiators were A.A. Zavrazhnov, Chief Physician from 2020 to 2023, and I.A. Reutsky, Chief Physician from 2023 to the present.

The conference was organized by the Government of St. Petersburg, St. Petersburg Health Care Committee, City Mariinsky Hospital, St. Petersburg State Pediatric Medical University, Russian Society of Surgeons, Pirogov Surgical Society, St. Petersburg Anesthesiology and Reanimatology

Fig. 2. The restored monument to Prince Peter Georgievich of Oldenburg on Liteyny *Avenue*, 2023

Рис. 2. Восстановленный памятник Принцу Петру Георгиевичу Ольденбургскому на Литейном проспекте, 2023 г.

Society, and St. Petersburg S.P. Botkin Therapeutic Society.

The educational goal of the event was to familiarize the conference audience with modern technologies, methods and results of scientific research on the basis of the multidisciplinary approach in emergency medicine.

The following specialists were invited to participate in the conference: health care organizers, general practitioners, general surgeons, anesthesiologists and reanimatologists, epidemiologists, rehabilitologists, diagnosticians and other specialists.

The program committee was headed by Igor Alexandrovich Reutsky. Co-chairmen of the Conference Organizing Committee were: Anatoly Anatolievich Zavrazhnov — Chief Physician of St. Petersburg State Budgetary Institution "City Mariinsky Hospital" (2020–2023), Honored Physician of the Russian Federation, Doctor of Medical Sciences, Professor; Dmitry Olegovich Ivanov — Rector of the Federal State Budgetary Educational Institution of Higher Professional Education, St. Petersburg State Pediatric Medical University of the Ministry of Health of Russia, Chief Supernumerary Neonatologist of the Ministry of Health of Russia, Doctor of Medical Sciences, Professor.

Larisa Vasilievna Scheglova — Head of Clinical and Analytical Department of St. Petersburg State Budgetary Institution "City Mariinsky Hospital", Honored Physician of the Russian Federation, Doctor of Medical Sciences, Professor, and Ivan Petrovich Dudanov — Corresponding Member of the Russian Academy of Sciences, Doctor of Medical Sciences, Professor, cardiovascular surgeon of St. Petersburg State Budgetary Institution "City Mariinsky Hospital" were appointed as Deputy Chairmen of the Organizing Committee.

The Organizing Committee also included Academician of the Russian Academy of Sciences G.G. Khubulava, Professor P.K. Yablonsky, Professor M.P. Korolev, Professor V.I. Orel, Professor Y.S. Alexandrovich and many others. L.Y. Artyukh became the executive secretary. The public organization " Human and His Health" was invited to assist the hospital management during the conference.

The scientific program of the conference included a plenary session and 8 sectional sessions:

1. Vascular catastrophes: ecosystem approach in providing emergency and planned medical care.
2. Anesthesiology-reanimation service in a multidisciplinary hospital of emergency medical care — current issues.
3. Modern strategies of emergency and urgent medical care in a multidisciplinary hospital.
4. Multidisciplinary approach in emergency surgery.
5. Surgery of peacetime injuries in terms of a multidisciplinary hospital.
6. Actual aspects of nephrological care in a modern multidisciplinary hospital.
7. Outpatient and inpatient medical care — unity of the treatment approach, 20 years in the epicenter of St. Petersburg health.
8. Quality issues of emergency and urgent medical care — accumulated experience and unsolved problems.

On December 7, 2023, 2 master classes were held on the territory of the hospital to await the conference.

The master class "Bedside ultrasound assessment of patients in critical condition in a multidisciplinary emergency hospital", aimed at

anesthesiologists-resuscitationist and doctors of functional diagnostics, consisted of two parts: "Algorithm of examination of patients in shock of unclear etiology (RUSH — HI MAP) and circulatory arrest (SHoC)" and "Sonographic stethoscope for routine examination of patients in ORIT".

After the welcoming words of Alexander Alexandrovich Andreenko, Deputy Chief Physician for Medicine, and Alexander Sergeevich Russin, Acting Deputy Chief Physician for Anesthesiology and Resuscitation, the participants gathered in the anti-shock ward of the Emergency Department.

Each part of the practical masterclass took more than 2 hours. The speaker of the master class was Roman Evgenievich Lakhin, Professor, Doctor of Medical Sciences, President of the Scientific and Practical Society of Anesthesiologists and Resuscitationists of St. Petersburg (Fig. 3). He personally demonstrated to the participants the method of rapid ultrasound examination (USI) of a patient in shock of unclear etiology and hypotension, which allows to promptly assess the patient's haemodynamic status. "Victims" were volunteers from the participants. Particular emphasis was placed on the algorithm of ultrasound sequence. After demonstration of ultrasound diagnostics, the algorithm of SHoC (Sonography in Hypotension and Cardiac Arrest) protocol application was discussed to identify potentially reversible causes of circulatory arrest.

The second part of the masterclass took place in the intensive care unit for cardiac surgical patients. Rapid bedside assessment of the patient in the intensive care unit (ICU) provides important information about the patient's condition and dynamics to determine the tactics of further intensive care, while focused echocardiographic examination provides valuable information about cardiac function and volemic status.

The training demonstrated techniques for visual assessment of cardiac contractility and quantitative measurements, Doppler assessment of pulmonary artery pressure and valve function. During the training event, a lung ultrasound protocol was also presented, which provides insight into stasis in the small circle of circulation and the presence of inflammatory changes in the lungs.

The second master class "Algorithms for the Safe Use of Electrosurgical Equipment" was conducted for surgeons of all specialties, clinical residents and surgical nurses and was opened by Igor Aleksandrovich Reutsky, Chief Physician of the Mariinsky Hospital (Fig. 4). He wished all those present to find practical application of new knowledge gained in their professional activities. Ivan Anatolievich Soloviev, Deputy Chief Physician for Surgery, moderated the training event "Algorithms for the Safe Use of Electrosurgical Equipment"; the speaker was Sergey Yurievich Vorontsov, an expert of the Technical Committee of the Russian Society of Endoscopic Surgeons (ROES), Development Director of EFA Medica.

During the master class the participants were given a brief overview of historical aspects of the emergence and development of electrosurgery, basic concepts of physical processes in the operation of HFED (high-frequency electrosurgical device). Specialists discussed the use of different modes of electrosurgical exposure and preparation of the working equipment, safety rules during its use and potential risks, as well as how to avoid complications, in particular, when using monopolar exposure in open and laparoscopic surgeries. All points of the electrosurgical exposure checklist were illustrated with videos and practical on-site demonstrations with physical demonstrations of argon plasma coagulation capabilities.

The Interregional Scientific and Practical Conference "Multidisciplinary Approach in Emergency and Urgent Medicine" started on 8 December 2023. More than 650 specialists from St. Petersburg and regions of Russia came to share their experience and knowledge.

The plenary session was opened with a video greeting to the participants by the Vice-Governor of St. Petersburg Oleg Nikolayevich Ergashev (Fig. 5).

A.N. Rzhanenkov, Chairman of the Commission on Social Policy and Healthcare of the Legislative Assembly of St. Petersburg, K.N. Zvonik, Director of the Territorial Compulsory Medical Insurance Fund, representative of the Healthcare Committee — A.V. Antropov, representative of the Pediatric University — Y.S. Aleksandrovich, Chief Physician of the Mariinsky Hospital from 1998 to 2020 — O.V. Emelyanov.

Professor A.A. Zavrazhnov spoke about the history of the Mariinsky Hospital and its role in the formation and development of national healthcare in the first report. Professor L.V. Scheglova made a report on the interaction of the hospital and medical universities of St. Petersburg as a practical base for students and residents, and Professor A.M. Volkov presented a report "Acute aortic syndrome", outlining the routing system created in the city to combat the disease, the causes of its occurrence and methods of its surgical correction. The chief freelance nephrologist of St. Petersburg

Fig. 3. Conducting a master class by Professor R.E. Lakhin in the intensive care unit

Рис. 3. Проведение мастер-класса профессором Р.Е. Лахиным в отделении реанимации и интенсивной терапии

Fig. 4. Chief Physician of the Mariinsky Hospital I.A. Reutsky, Deputy Chief Physician for Surgery I.A. Solovyov, Deputy Chief Physician for Medical Affairs A.A. Andreenko (from left to right) at the opening of the master class "Algorithms for the safe use of electrosurgical equipment"

Рис. 4. Главный врач Мариинской больницы И.А. Реутский, заместитель главного врача по хирургии И.А. Соловьев, заместитель главного врача по медицинской части А.А. Андреенко (слева направо) на открытии мастер-класса «Алгоритмы безопасного использования электрохирургического оборудования»

Fig. 5. Opening of the conference

Рис. 5. Открытие конференции

A.N. Belskikh presented the report “Nephrology and renal replacement therapy in St. Petersburg”, highlighting the main achievements and problems of nephrological care in the city.

At the end of the plenary session the work on specialized sections began. The section “Vascular Catastrophes: Ecosystem Approach in Emergency and Planned Medical Care” was led by Professor L.V. Shcheglova (Fig. 6), Professor A.M. Volkov, Professor I.A. Voznyuk and Corresponding Member of the Russian Academy of Sciences I.P. Dudanov. Eight reports were presented at the section, one of the most interesting among them was the report “Pathophysiology of postischemic cognitive disorders — why are there so many ‘dementia’ and ‘depression’?”, presented by Igor A. Voznyuk, Chief Supernumerary Neurologist of the Health Care Committee.

The section “Anesthesiology-Resuscitation Service in a Multidisciplinary Emergency Medical Care Hospital — Current Issues” was headed by Professor Y.S. Alexandrovich. In the course of the session the reports of Professors R.E. Lakhin “Central vein catheterisation using ultrasound navigation in shock” from the Kirov Military Medical Academy, D.V. Zabolotsky “Postoperative anesthesia — what we can do today” from the St. Petersburg State Pediatric Medical University were heard. Besides, the reports of the heads of the resuscitation departments of the Mariinsky Hospital, during which the participants of the section received basic information about intensive care of severe closed chest trauma, the results of which were presented to the participants of the session.

The section “Multidisciplinary Approach in Emergency Surgery”, which gathered more than 90 conference participants, provoked vigorous discussion and interest. The section headed by Professor I.A. Soloviev discussed the methods of treatment of gastrointestinal ulcer bleeding by arterial embolization, diagnosis and treatment of pulmonary and gastroduodenal bleeding, modern approaches to the treatment of acute appendicitis and esophageal ruptures. Many questions were also raised by the reports of colleagues from other hospitals of the city, which presented their own experience in providing surgical care to patients with mechanical jaundice, perforative diverticulitis of the colon and pinched inguinal hernia.

The speakers of the panel session “Modern strategies of emergency and urgent medical care in a multidisciplinary hospital” under the direction of the Deputy Chief Medical Officer A.A. Andreenk, the Chief Consultant of the Ministry of Health of Russia in the North-West Federal District in the direction of “first aid” A.I. Makhnovsky and Professor E.K. Gumanenko presented information about the principles of work of a hospital team in an in-patient emergency department, algorithms of work of

Fig. 6. Presidium of the section "Vascular Catastrophes: an ecosystem approach in emergency and planned medical care", from left to right: Head of the Department of General and Faculty Surgery of Petrozavodsk State University, Corresponding Member of the Russian Academy of Sciences, Professor I.P. Dudanov, Deputy Head of the 1st Department of Advanced Surgery doctors of the Kirov Military Medical Academy, Professor A.M. Volkov, Head of the Clinical and Analytical Department of the Mariinsky Hospital, Head of the Department of Family Medicine of the Faculty of Postgraduate and Additional Professional Education of St. Petersburg State Medical University, Professor L.V. Shcheglova

Рис. 6. Президиум секции «Сосудистые катастрофы: экосистемный подход в оказании экстренной и плановой медицинской помощи», слева направо: заведующий кафедрой общей и факультетской хирургии Петрозаводского государственного университета, член-корреспондент РАН, профессор И.П. Дуданов, заместитель начальника 1-й кафедры хирургии усовершенствования врачей Военно-медицинской академии им. С.М. Кирова, профессор А.М. Волков, руководитель клинико-аналитического отдела Мариинской больницы, заведующая кафедрой семейной медицины факультета последипломного и дополнительного профессионального образования СПбГПМУ, профессор Л.В. Щеглова

multidisciplinary teams in the course of emergency treatment of patients with patients with acute cerebral circulatory disorders (ACBD) in the therapeutic window, experience in applying internal algorithms of medical care for patients with out-of-hospital circulatory arrest, and much more (Fig. 7).

The sections 'Topical aspects of nephrological care in a modern multidisciplinary hospital' chaired by the Chief Consultant Nephrologist of St. Petersburg was successfully held. The sections "Outpatient and inpatient medical care — unity of approach, 20 years in the epicenter of public health in St. Petersburg" chaired by Professor V.I. Orla were also successfully carried out (Fig. 8).

The participants of the section "Surgery of peacetime injuries in a multidisciplinary hospital", moderated by Professor E.K. Gumanenko, received information about approaches to the treatment of closed abdominal trauma, tactics of its non-operative treatment, minimally invasive methods of fixation of pelvic bone fractures in the acute period of traumatic disease, modern methods of treatment in the conditions of the first (third) level trauma center.

The panel session on "Quality Issues of Emergency and Urgent Medical Care — Accumulated Experience and Unresolved Problems" chaired by Chief Physician I.A. Reutsky and featuring representatives of practical healthcare and employees of the St. Petersburg Healthcare Committee was beneficial as the main issues of quality and safety control of medical activities and the specifics of expert activities in a multidisciplinary hospital were discussed.

An exhibition of the Mariinsky Hospital Museum was set up in the lobby of the Congress Centre of the COSMOS Hotel, where rare museum exhibits were presented (Fig. 9). Some stands of the exhibition were dedicated to the

Fig. 7. The Presidium of the section "Modern strategies for the provision of emergency and emergency medical care in a multidisciplinary hospital", from left to right: Deputy Chief Physician for the medical part of the Mariinsky Hospital A.A. Andreenko, Deputy Chief physician for medical work of the City Ambulance Station L.E. Yelchinskaya, Deputy Chief Physician for Emergency Medical Care of the Scientific Research Institute *named after* I.I. Dzhanelidze A.I. Makhnovsky, Head of the Department of Extreme Medicine, Traumatology, Orthopedics and Military Field Surgery of Saint Petersburg State Pediatric Medical University, Professor E.K. Humanenko

Рис. 7. Президиум секции «Современные стратегии оказания экстренной и неотложной медицинской помощи в многопрофильном стационаре», слева направо: заместитель главного врача по медицинской части Мариинской больницы А.А. Андреенко, заместитель главного врача по медицинской работе Городской станции скорой медицинской помощи Л.Э. Ельчинская, заместитель главного врача по скорой медицинской помощи НИИ им. И.И. Джанелидзе А.И. Махновский, заведующий кафедрой экстремальной медицины, травматологии, ортопедии и военно-полевой хирургии СПбГПМУ, профессор Е.К. Гуманенко

Fig. 8. Head of the section "Outpatient and inpatient medical care — unity of approach, 20 years in the epicenter of public health in St. Petersburg", Head of the Department of Social Pediatrics and Health Organization of Saint Petersburg State Pediatric Medical University, Honored Scientist of the Russian Federation Professor V.I. Orel

Рис. 8. Руководитель секции «Амбулаторная и стационарная медицинская помощь — единство подхода, 20 лет в эпицентре здоровья населения Санкт-Петербурга», заведующий кафедрой социальной педиатрии и организации здравоохранения ФП и ДПО СПбГПМУ, заслуженный деятель науки РФ, профессор В.И. Орел

anniversary dates of the hospital departments. For example, one was dedicated to the 100th anniversary of the establishment of the otorhinolaryngology department. Materials of the past conference were published in the journal of St. Petersburg State Pediatric University “Medicine: Theory and Practice” Vol. 8, No. 4 for 2023.

CONCLUSION

The conference dedicated to the 220th anniversary of the Mariinsky Hospital acquainted the participants with modern views on the multidisciplinary approach in emergency and urgent medical care, up-to-date information on the latest

recommendations and algorithms of diagnosis and treatment, modern trends in the quality and safety of medical activity, ambulatory care and emergency medical care.

We hope that the experience of the conference can be applied by other medical organizations to illustrate the main problems and achievements of inpatient emergency and urgent medical care. The highlighted multidisciplinary experience of medical care is significant both for the entire health care system of the city of St. Petersburg and for Russia as a whole.

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.

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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Fig. 9. Museum exhibition, pictured (from left to right) Associate Professor of the Department of General Surgery of St. Petersburg State Medical University L.D. Bechvaya and curator of the Museum of the Mariinsky Hospital A.V. Kovalevsky

Рис. 9. Музейная выставка, на фото (слева направо) доцент кафедры общей хирургии СПбГПМУ Л.Д. Бечвая и хранитель музея Мариинской больницы А.В. Ковалевский

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UDC 371.122.1+616-053.2+614.2-082
DOI: 10.56871/MHCO.2024.24.44.013

PRACTICAL HEALTHCARE COOPERATION WITH SCIENCE IS THE KEY TO CHILDREN'S HEALTH

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For citation: Ivanov DO, Orel VI, Kim AV, Gureva NA, Smirnova VI, Sharafutdinova LL, Roslova ZA. Practical healthcare cooperation with science is the key to children's health. Medicine and Health Care Organization. 2024;9(2):146–155. DOI: https://doi.org/10.56871/MHCO.2024.24.44.013

Received: 15.05.2024 ***Revised: 19.06.2024*** ***Accepted: 15.07.2024***

ABSTRACT. In 2024 on the basis on the St. Petersburg State Pediatric Medical University the VIII National Congress with the international participation "Children's Health — the future of the country" (hereinafter — the Congress) was held, dedicated to the 130th anniversary of the birth of Academician of the Academy of Medical Sciences of the USSR Alexander Fedorovich Tur. The dates of the Congress in 2024, as in previous years, were timed to coincide with the International Children's Day: May 31 — June 1–2. Traditionally the Congress was held at one of the country's leading universities, St. Petersburg State Pediatric Medical University, which became another platform for sharing the experience of colleagues from abroad and various regions of our country, as well as for finding solutions to the most pressing problems of pediatrics. The Congress was organized by the Ministry of Health of the Russian Federation, the Legislative Assembly of St. Petersburg, the Government of St. Petersburg, the Health Committee of the Government of the Leningrad Region, the St. Petersburg State Pediatric Medical University of the Ministry of Health of the Russian Federation, the Union of Pediatricians of Russia, the Interregional Public Organization League of Doctors of the North-West. As in the previous year, the plenary session, all international conferences, symposiums, round tables and master classes held within the framework of the Congress were videotaped. Foreign guests had an opportunity to join the discussion in the classrooms through electronic systems. Every year, the congress gathers more than 2500 participants from 15 countries and more than 80 cities in Russia. Within the framework of the forum, international conferences, an open meeting of the main neonatologists of Russia, a Russian-Chinese teleconference, symposiums, round tables and master classes were held, more than 400 oral reports and more than 20 poster presentations were heard and discussed.

KEYWORDS: national congress, children, health organization and public health, pediatric care

СОТРУДНИЧЕСТВО ПРАКТИЧЕСКОГО ЗДРАВООХРАНЕНИЯ С НАУКОЙ — ЗАЛОГ ДЕТСКОГО ЗДОРОВЬЯ

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Для цитирования: Иванов Д.О., Орел В.И., Ким А.В., Гурьева Н.А., Смирнова В.И., Шарафутдинова Л.Л., Рослова З.А. Сотрудничество практического здравоохранения с наукой — залог детского здоровья // Медицина и организация здравоохранения. 2024. Т. 9. № 2. С. 146–155. DOI: https://doi.org/10.56871/MHCO.2024.24.44.013

Поступила: 15.05.2024 ***Одобрена: 19.06.2024*** ***Принята к печати: 15.07.2024***

РЕЗЮМЕ. В 2024 г. состоялся VIII Национальный конгресс с международным участием «Здоровые дети — будущее страны» (далее — Конгресс), посвященный 130-летию со дня рождения академика АМН СССР Александра Федоровича Тура. Сроки проведения Конгресса в 2024 г., как и в прошлые годы, были приурочены к Международному дню защиты детей: 31 мая — 1–2 июня. По традиции Конгресс прошел в одном из ведущих вузов страны, Санкт-Петербургском государственном педиатрическом медицинском университете, который стал еще одной площадкой по обмену опытом коллег из-за рубежа и различных регионов нашей страны, а также по поиску решений наиболее актуальных проблем педиатрии. Организаторами Конгресса выступили Министерство здравоохранения Российской Федерации, Законодательное собрание Санкт-Петербурга, Правительство Санкт-Петербурга, Комитет по здравоохранению правительства Ленинградской области, ФГБОУ ВО «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России, Союз педиатров России, Межрегиональная общественная организация «Лига врачей Северо-Запада». Как и в прошлом году, осуществлялась видеотрансляция пленарного заседания, всех международных конференций, симпозиумов, круглых столов и мастер-классов, проводимых в рамках Конгресса. Иностранные гости имели возможность подключиться к дискуссии в аудиториях посредством электронных систем. Ежегодно Конгресс собирает более 2500 участников из 15 стран и более 80 городов России. В рамках форума прошли международные конференции, открытое совещание главных неонатологов России, российско-китайский телемост, симпозиумы, круглые столы и мастер-классы, было заслушано и обсуждено более 400 устных докладов и более 20 — постерных.

КЛЮЧЕВЫЕ СЛОВА: национальный конгресс, дети, организация здравоохранения и общественное здоровье, педиатрическая помощь

The annual National Congress “Healthy Children — the Future of the Country” has become a tradition in the pediatric community both in our country and abroad. In 2024, the VIII National Congress with international participation “Healthy Children — the Future of the Country” was held, commemorating the 130th anniversary from the birth of Alexander Fedorovich Tur, Academician of the USSR Academy of Medical Sciences . The St. Petersburg State Pediatric Medical University became the venue of the Congress. The main purpose of the Congress was to discuss topical issues of children’s health care, to improve medical care for children, to develop unified approaches to prevention, diagnosis, treatment and rehabilitation. The Congress events contributed to the professional development of pediatric health care specialists, dissemination of best practices of colleagues from different regions of Russia and other countries, introduction of modern technologies in medicine.

The Congress was held in accordance with the Plan of Scientific and Practical Events of the Ministry of Health of the Russian Federation in 2024 (Order No. 726 issued by the Ministry of Health of the Russian Federation on 29 December 2023 “On Approval of the Plan of Scientific and Practical Events of the Ministry of Health of the Russian Federation in 2024”).

Guests of honour and participants of the Congress were leading Russian and foreign specialists of children’s health care, chief specialists of health care authorities of Russian regions, heads of medical organizations, representatives of the authorities, practicing doctors.

According to the established tradition, the Congress was conducted by Vasily Ivanovich Orel, Honored Scientist of the Russian Federation, Doctor of Medical Sciences, Professor, Vice-Rector for Academic Affairs, Head of the Department of Social Pediatrics and Health Care Management of the Faculty of Pediatrics and Vocational Education and Training. Dmitry Olegovich Ivanov, President of the Congress, Rector of St. Petersburg State Pediatric Medical University, Doctor of Medical Sciences, Professor, Chief Consultant Neonatologist of the Ministry of Health of the

Russian Federation, made a welcoming speech. In his speech he noted that “Health care and education in our country always attracted close attention. Proper setting of tasks, inexhaustible enthusiasm and excitement which is characteristic for representatives of national medicine, readiness to discuss and share knowledge and experience with each other have always helped to achieve success and efficiently solve problems faced by the medical community. For the eighth year in a row, the National Congress with international participation “Healthy Children — the Future of the Country” has become an effective platform for cooperation between practical healthcare and basic science, a meeting point for absolutely different people who were united by one common goal: to create ideal conditions for providing medical care to children from conception to adulthood. Our congress is designed to bring together representatives of governmental authorities, educational, scientific and medical organizations of Russia, small, medium and large businesses, young scientists, leading Russian and foreign experts in the field of medicine, pharmaceuticals and information technologies” (Fig. 1).

Fig. 1. Rector of St. Petersburg State Pediatric Medical University, Doctor of Medical Sciences, Professor Dmitry Olegovich Ivanov at the opening of the Congress “Healthy children — the future of the country”

Рис. 1. Ректор Санкт-Петербургского государственного педиатрического медицинского университета, доктор медицинских наук, профессор Дмитрий Олегович Иванов на открытии Конгресса «Здоровые дети — будущее страны»

On behalf of the Government of St. Petersburg the participants of the Congress were welcomed by Oleg Ergashev, Vice-Governor of St. Petersburg, who noted that “This hall brought together leading experts not only from Russia, but also from abroad. I am proud of the fact that our country has managed to build a unique system of assistance to children, which has no analogues in the whole world...

It is impossible not to mention the successes we have already achieved. Today, the infant mortality rate in Russia has reached a historic minimum of 4.2 ppm. This means that our doctors manage to save more children’s lives than their colleagues from many foreign countries. The fight continues for every child, and those stories of rescue, which yesterday seemed incredible and miraculous, do not surprise us today. And it is equally important that the fight goes on not only for the life of each patient, but for the quality of this life...”.

Yuri Lobzin, the President of the Children’s Research and Clinical Centre for Infectious Diseases, Academician of the Russian Academy of Sciences, Professor Leyla Namazova-Baranova, Honored Scientist of the Russian Federation, Academician of the Russian Academy of Sciences, Chairman of the Executive Committee of the Union of Pediatricians of Russia, Doctor of Medical Sciences, and Raufu Oruj oglu Baylarov, Vice-Rector for Research of Azerbaijan Medical University addressed the Congress with welcoming addresses. Members of the Federation of Rectors of Russian and Arab Universities sent their video messages: Dr Samaha Bashir, General Counsellor of the Federation, Muhammad Said Hanbash, President of Hadramawt University (Yemen), Wael Nabil Abdel Salam, President of the Arab University of Beirut (Lebanon), Alsunduk Tahani, Vice Rector, Dean of the Faculty of Dentistry, Professor of Al-Turan University (Iraq).

The Congress included discussions on the most urgent problems of pediatrics, neonatology, pediatric surgery, anesthesiology and resuscitation, healthcare organization, rehabilitation, sports medicine, nephrology, pediatric cardiology, morphology and physiology of the child, psychological features of modern children and adolescents, infectious diseases, medical education and other areas. The focus of attention was on interdisciplinary presentations, case studies, discussion of new methods and treatments. Much attention was paid to new regulatory documents and clinical recommendations.

The Congress included conferences, breakout sessions, including those with international participation:

- Neonatology: achievements and opportunities.
- Evidence-based pediatrics.
- Knowledge of propaedeutics is the basis of clinical thinking of a pediatrician.
- Rare and complex cases in pediatric surgery and anaesthesiology- reanimatology.
- Actual problems of pediatric nephrology.
- Rehabilitation and sports medicine.
- Actual questions of diagnostics and morphogenesis of childhood diseases.
- Favourable environment for children.
- Childhood — space of psychological safety.
- Rare and complicated cases in pediatric surgery and anaesthesiology-reanimatology.
- Logopathology and speech therapy: A dialogue of science and practice.
- V St. Petersburg Symposium on Morphology, Biochemistry, Normal and Pathological Physiology of the Child.
- Children's health in modern society: problems and ways of solution.
- Obstetrics and Gynaecology — modern realities and prospects.
- International Conference In Pediatric Rheumatology: the Focus On Autoinflammation.
- The role of nurses in enhancing quality of life and reproductive potential.
- Interdisciplinary poster session.

In addition to the conferences, an open meeting of the chief neonatologists of Russia, Russian-Chinese teleconference, symposia, round tables and master-classes were held, more than 400 reports and more than 20 posters were heard and discussed.

The main topics for discussion were:

- Implementation of Priority National Project "Health Care" in terms of maternal and child health care:
  1. Infant and child mortality and demographic problems. New opportunities and solutions to maintain and improve indicators in the Russian Federation.
  2. Improving accessibility and quality of medical care for women and children.
  3. Audit of compliance with clinical recommendations for pediatric and neonatal care.
- First results of extended neonatal screening in the Russian Federation.
- Medical and genetic counselling and research for solving actual problems of reproductive medicine, neonatology and pediatrics.
- Pediatric dietetics as a special section of propaedeutics of pediatric diseases. Nutrition of a healthy and sick child. Nutriciology of infancy.
- Neonatal rheumatology: the importance of early diagnosis and therapeutic options.
- Reanimation and intensive care in pediatrics and neonatology. Infectious-inflammatory diseases, lesions of the central nervous system.
- Neonatal and foetal surgery: unique cases and innovative technologies.
- Emergency conditions in pediatrics and pediatric surgery.
- Modern technologies and rare (atypical) cases in pediatric surgery.
- Problems of children's disability and possibilities of rehabilitation.
- Chance for survival — surgical methods of treatment.
- Actual problems of pediatric nephrology.
- Catamnesis of premature newborns. How to organize it? What problems? What conclusions?
- Phthisiatry of early age. Tuberculosis in very young children.
- The role of fundamental developments in children's health care.
- Primary medical care to the pediatric population: problems and solutions.
- Audit of the quality of medical care for children. Clinical audit in a neonatological hospital.
- Immunological prevention of infectious diseases in pediatrics.
- Realisation of international projects in the field of children's health care.
- Possibilities of sports medicine for children.
- Ultrasound, functional and molecular diagnostics in pediatrics and neonatology: promising developments and opportunities.
- Recent trends in professional medical education.
- Actualisation of the order of pathological and anatomical investigations in pediatric practice.
- Questions of childhood psychology. Speech disorders and their correction.

The international conference "Evidence-based pediatrics" organized the round table "Modern standards in pediatric practice". There were discussed problems of differentiated diagnostics, modern approaches to diagnostics and standards of treatment of the most common diseases in the practice of a district pediatrician (endocrine and allergic diseases, digestive system diseases, etc.), as well as problems of diagnostics and medical care for life-threatening conditions in children at the outpatient stage. There was also presented the Diary of a Healthy Child, developed in St. Petersburg State Pediatric University to improve cooperation between pediatricians and the patient's legal representatives. The participants defined the importance of breastfeeding in the first months of life and gave recommendations on how to preserve lactation in case of functional disorders.

"Tuberculosis in infants" was focused on BCG vaccination of newborns in maternity hospitals and perinatal centres, contraindications to vaccination, possible complications and ways to prevent them. Special attention is paid to the problem of congenital tuberculosis, prevention of tuberculosis in neonates born from tuberculosis-affected mothers, peculiarities of the clinical course of this infection in young children, difficulties in diagnosis and verification of the diagnosis taking into account anatomo-physiological features, indications and contraindications to the prescription of anti-tuberculosis drugs for young children. The experience of tuberculosis screening in Belarusian children was presented by L.A. Gorbach, Associate Professor from Minsk.

Within the framework of the international conference "Rare and Complex Cases in Pediatric Surgery and Anaesthesiology-Ranimatology", E.Yu. Felker held a master class "Possible variants of automation in anaesthesiology taking into account artificial intelligence", where the participants were provided with an overview of modern methods of automation using artificial intelligence. Advantages, difficulties and prospects of using artificial intelligence equipment were shown on the example of video recordings of work with patients in the Department of Anaesthesiology-Resuscitation of St. Petersburg State Medical University.

Another master class "Method of umbilical hernia treatment" was conducted by Doctor of Medical Sciences V.G. Svarich, who presented his method of herniorrhaphy. This method has been applied since 2016 in the surgical department of the Republican Children's Clinical Hospital in Syktyvkar. The proposed method simplifies the technique of surgery in children, reduces the operation time and the risk of postoperative complications, preserves the anatomy of the umbilical region, eliminates the stage of suturing postoperative wounds.

The international conference "Neonatology: Achievements and Opportunities" included an open meeting of chief neonatologists of Russia, where the issues of infant and child mortality, peculiarities of routing of newborns, mastering of clinical recommendations by specialized specialists, organization of medical care for children at different stages, etc. were discussed. During this conference, symposia "Neonatal Neurology: Innovations and Achievements" and "Rare Diseases in Newborns" were held. The participants raised the problems of studying and researching neurological and rare diseases in newborns, since the early detection and treatment leads to better results and higher quality of life.

The international conference "Children's Health in Modern Society: Problems and Solutions" (Fig. 2), which was organized by the Department of Social Pediatrics and Health Care Management of the Faculty of Pediatrics and Additional Professional Education (APE) and the Department of Public Health and Health Care of SPbSMU, hosted a Russian-Chinese teleconference "Analysis of the State of Treatment of Premature Infants in China: Studies Based on CHNN (Chinese Neonatal Network) Data". During the Russian-Chinese dialogue, Dr. Lin Yuan, Director of the Neonatal Medical Center at the Children's Hospital of Fudan University, presented the latest systems of medical database organization and their application for the analysis of treatment of premature infants in China.

Some presentations were aimed at improving the organizational structure of the medical center in order to increase the accessibility of primary health care to the population. Specifically, the report "Outpatient consultative units of a multidisciplinary hospital as a reserve for increasing the accessibility of primary health care" (Orel V.I., Shmidt T.A., Kirichenko I.Ya., Department of Social Pediatrics and Health Care Organization of the Faculty of Pediatrics and APE) presented activities of an outpatient consultative unit of the Mariinskaya Hospital. The hospital comprises unique medical departments and centers, such as the city phoniatrics office, the city nephrology center, the city center for professional pathology

Fig. 2. Conference "Children's Health in modern society: problems and solutions"

Рис. 2. Конференция «Здоровье детей в современном обществе: проблемы и пути решения»

and rehabilitation of professional patients, where patients receive medical care from highly qualified specialists of a narrow profile, which is impossible to access in the polyclinic at their place of residence. Outpatient and consultative units of the hospital can use all the resources in their work, which makes it possible to create a "closed cycle", providing medical care to patients and making it significantly more accessible for residents of St. Petersburg.

Since 2018, the priority project "Creation of a new model of a medical organization providing primary health care" has been launched in our country. The report "Application of Lean Technologies in Medical Organizations Providing Outpatient Medical Care for Dental Diseases" (V.A. Zatulkin, N.A. Gurieva, V.I. Smirnova, Department of Social Pediatrics and Health Care Organization of PF and APE) outlines prerequisites for introducing organizational changes in outpatient dental care. The questionnaire survey of patients showed that 35.0% of people are not satisfied with medical care in the dental polyclinic, more than half (52.9%) spend more than 10 minutes at the registration desk, respondents also complained about queues in front of the doctor's office and difficulties in making an appointment. Among doctors, 80.0% believe that the main problem when receiving a patient is the long time spent on paper medical documentation. Low employee involvement is evidenced by the fact that the vast majority (75.7%) did not see the need for organizational changes, every third person is not ready to make suggestions to improve the work of the medical organization, as they believe that the polyclinic administration will not take them into account. To improve the quality and accessibility of dental care at the outpatient stage, the authors proposed the introduction of lean production tools, such as "open registration" and introduction of an administrator, optimal information support and convenient navigation in the polyclinic, creation of a call center, electronic document management, etc.

D.V. Chentsov, Chief Physician of City Polyclinic No. 40, postgraduate student of the Department of Social Pediatrics and Health Care Organization of PF and APO, presented his report "Modern approaches for creating a culture of health care among adolescents". In St. Petersburg, a regional model of preventive care for children has been formed, which is headed by the City Centre for Public Health and Medical Prevention (CCHMP). An important aspect of this model is active promotion of healthy lifestyle measures and encouraging

the population to preserve their health. To actualize the work on medical prevention, which determines the effectiveness of adolescents' participation in the prevention of health disorders, it is necessary to strengthen "medical awareness". Medical awareness is the potential of knowledge and skills on health protection, which is formed under a set of measures on hygiene education and training. The main forms of preventive work among adolescents include health lessons, competitions, campaigns, station games and excursions to the CCHMP museum. Some examples of topics discussed at health lessons are: "Be healthy!", "Nutrition is good for you!", "Movement is life", "Smoking is bad for your health", "Alcohol and health", etc. CCHMP actively cooperates with medical and educational organizations, the health departments of district administrations, social services, the Commissioner for Children's Rights, etc.

The problems of medical support for adolescents and young people, especially during the transition to adult outpatient clinics, were raised in the report "Contemporary Problems of Departmental Interaction in Medical Care for Adolescents and Young People" (Kim A.V., Samoilova O.S., Department of Social Pediatrics and Health Care Organization of PF and APE). The authors identified three groups of problems:

1) organizational and methodological problems: lack of continuity in the work of children's and adult outpatient clinics; lack of regulatory and legal documentation; lack of an organizational mechanism and specific algorithm for transferring adolescents from a children's outpatient network to an adult one; lack of departmental control over this process;
2) lack of an individual and comprehensive approach to the medical care of young people: low motivation of adolescents and young people to preserve their health; insufficient information about transfer to the adult network, goals and procedures of medical check-ups; work with teenagers in adult outpatient clinics on request rather than on active invitation; low coverage of 18-year-old patients by medical check-ups; untimely placement of patients with chronic diseases on medical follow-up;
3) material and technical problems: lack of digitalization of the transfer process — high Labor intensity and time losses during manual selection of a patient register and paper pediatrics; economic and time losses: paper and cartridge for paper disease histories, driver's resource; lack of a separate module in the medical information system (MIS) for working with adolescents.

Professor of Ivanovo State Medical University I.E. Boboshko introduced a specific type of adolescents' response to recurrent acute respiratory illnesses (ARI) in her presentation "Medical and social aspects in practice of monitoring frequently and long-term sick children". This response included increased emotional sensitivity, fixation of negative events, instability and inconsistency of feelings and desires, inhibition of external expression of feelings and experiences, immersion in oneself, lack of openness to others. In this regard, it is especially important to define a rehabilitation potential and its possibilities in medical and social assistance to such children. Rehabilitation potential is a complex of biological and psychophysical characteristics of a person, as well as social and environmental factors that allow him or her to realize his or her potential abilities to a greater or lesser extent. The diagnosis of psychological and social problems at a medical and social assistance department of a children's outpatient clinic complements the assessment of rehabilitation potential by a district pediatrician as part of the dispensary monitoring of a child with health problems. The correction of psychological and social problems through the improvement of rehabilitation potential makes it possible to increase effectiveness of medical monitoring (Fig. 3).

Two reports were devoted to assisted reproductive technologies (ART).

T.A. Krivolesova, Head of the Department of Assisted Reproductive Technologies of St. Petersburg State Pediatrics University, Candidate of the Department of Social Pediatrics and Health Care Organization PF and APE, presented the topic "Patients Opinion on the Availability of Medical Care with In Vitro Fertilisation". According to the conducted sociological research, the main problems in organizing medical care for IVF treatment were: the need for a large number of tests and analyzes before IVF (48.2% of women and 17.2% of men); unpredictability of pregnancy after IVF (35.7% and 11.2%, respectively); lack of possibility to perform all tests and consultations at the place of residence (32.1% and 17.0%, respectively); the need to pay for separate laboratory and diagnos-

Fig. 3. Speech by Doctor of Medical Sciences, Professor of Ivanovo State Medical University I.E. Boboshko. Presidium: Honored Scientist RF, Doctor of Medical Sciences, Professor V.I. Orel, Honored Scientist RF, Doctor of Medical Sciences, Professor V.K. Yuryev

Рис. 3. Выступление доктора медицинских наук, профессора Ивановского государственного медицинского университета И.Е. Бобошко. Президиум: Заслуженный деятель науки РФ, доктор медицинских наук, профессор В.И. Орел, Заслуженный деятель науки РФ, доктор медицинских наук, профессор В.К. Юрьев

tic tests (30.4% and 27.4%, respectively); long waiting times for a doctor's consultation (26.8% and 24.1%, respectively); long waiting times for diagnostic tests (21.4 and 18.9%, respectively); long waiting times for IVF procedures (19.6 and 6.9%, respectively); lack of free individual or group psychological support for couples diagnosed with infertility (5.4 and 3.4%, respectively) (Fig. 4).

The authors of the report "Medical and social profile of patients of the department of pregnancy pathology who overcame infertility with the help of ART" (Moiseeva K.E., Harbedia Sh.D., Sergienko O.I., Department of Public Health and Healthcare) presented the results of a sociological study conducted in the department of pregnancy pathology of St. Petersburg State Pediatric Medical University. The share of patients who overcame infertility with the help of ART and received medical care paid by obligatory medical insurance funds was 92.4%. The proportion of unmarried patients was only 6.1 and 11.2% of pregnant women had multiple pregnancies. More than half of the patients had a second pregnancy or more (55.9%), which occurred after the second or subsequent attempts (56.1%). However, in the majority of cases it was the first birth (76.8%). In 77.5% of the women, infertility was diagnosed before the age of 35 years. Most of the cases were primary (61.0%) and female (88.0%) infertility. The mean age of primary infertility was 30.04±2.72 years, secondary infertility 31.04±1.95 years, female infertility 30.71±2.11 years and male infertility 30.65±2.06 years ($p > 0.05$). Abortions occurred in 41.5% of women who became pregnant using ART, and 20.5% of the patients had fetal pathology. The most common pathologies during pregnancy were endocrine diseases (65.9%, gestational diabetes mellitus 30.5%), myopia (40.7%), anemia (38.8%), genitourinary diseases (26.3%) and pre-eclampsia (25.1%). COVID-19 or acute respiratory viral infections (ARVI) were observed in 20.7% of IVF pregnant

Fig. 4. Speech by the head of the Department of Assisted Reproductive Technologies of St. Petersburg State Medical University T.A. Krivolesova Presidium: Honored Scientist RF, Doctor of Medical Sciences, Professor V.I. Orel

Рис. 4. Выступление заведующей отделением вспомогательных репродуктивных технологий СПбГПМУ Т.А. Криволесовой. Президиум: Заслуженный деятель науки РФ, доктор медицинских наук, профессор В.И. Орел

women. The most frequent principal diagnosis on admission was caesarean section delivery (44.6%) and preterm Labor (25.9%).

The analysis of abortion prevalence in the Russian Federation, the North-West Federal District (NWFD) and St. Petersburg for 2018–2022 is presented in the report "Assessment of medical and social factors determining abortion behaviors" (V.K. Yuryev, V.V. Sokolova, A.N. Kuzmin, V.V. Kirilenko, Department of Public Health and Healthcare). The conclusions drawn by the authors indicate a low level of abortion prevalence in St. Petersburg (8.6 per 1,000 women of fertile age) compared to the North-West Federal District and the Russian Federation (11.4 per 1,000), and a downward trend in this indicator in all the territories studied. In Russia as a whole, there is a negative trend in the growth of abortions among first-pregnant women. Among the women who were referred for abortion, the predominant groups were 20–24 and 25–29 year olds, residents of St. Petersburg, with higher or incomplete higher education, average or low income, married and with children (usually one child). Increased abortion history was characteristic of newcomers from other regions, with secondary special education, working in state-funded organisations, having low or high income, registered or open marriage and having children (more often two or more). Despite high self-assessment of knowledge about contraception, pregnancy was unplanned for the majority of respondents as a result of irregular use of combined oral contraceptives and the calendar method and interrupted sexual intercourse. The main reasons for pregnancy termination were insufficient financial income and the lack of a permanent job.

Issues of economic nature were devoted to the speeches "Formation of universal competence in the field of economic culture and financial literacy in students of medical school" (Kirilenko V.V.,

Sokolova V.V., Department of Public Health and Public Healthcare), where the problems of implementation of curricula for training medical students in the formation of universal competences and, in particular, competences in the field of economic and financial literacy were considered. In order to implement the state policy in the sphere of health care and to increase the flexibility and responsiveness of the health care management system at the level of medical organisations, it was proposed to pay attention to the formation of economic culture and financial literacy of medical personnel, to develop approaches and recommendations aimed at training medical personnel to work in crisis economic conditions, rational planning and optimisation of activities.

The report "Methodology of differentiated approach to incentive payments in medical organizations providing primary health care" (Kim A.V., Sochkova L.V., Department of Social Paediatrics and Health Care Organisation, PF and APE) concerned differentiated approach to remuneration of medical workers of primary health care. The authors present a developed formalized, easy-to-use system for recording the activity of each employee of a medical organization, based on specially developed local labour standards, with the inclusion of an individual assessment of his/her activity and allowing a differentiated approach to the appointment of incentive payments. This system takes into account the target indicators of the implementation of state and regional programsin the field of health care. The questionnaire survey conducted among the employees of adult outpatient clinics showed an increase in satisfaction with their final labor results — monthly salary — after the introduction of the differentiated remuneration system. This year the lecture part of the Congress was reduced, and the main attention was paid to the work in small groups — master classes, seminars, trainings and other activities.

This year, the lecture part of the Congress was reduced and the focus was on small group work — masterclasses, seminars, trainings and other activities.

The Congress was attended not only by Russian specialists from different regions of our country, but also by guests from Belarus, China, Uzbekistan, Kazakhstan, Turkey, Italy, Saudi Arabia.

Within the system of Continuing Medical Education (CME) the topics of the Congress were accredited in 54 specialties for doctors and 21 specialties for nursing staff.

According to the results of the Congress, it can be concluded that the health of modern children is a cause for concern: the number of practically healthy children is decreasing, the number of children suffering from chronic pathology is growing, and the number of school graduates diagnosed with 2–3 chronic diseases is increasing. Therefore, the development and implementation of new forms of preventive, therapeutic, medical, social and psychological care for children remains an urgent task for children's health care.

All participants noted that the exchange of experience between doctors and researchers is important for the improvement of such work, which is possible within the framework of such meetings and other forums.

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. The authors declare no external funding while writing this article.

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 написании статьи.

ПРАВИЛА ДЛЯ АВТОРОВ

Утв. приказом и.о. ректора
ФГБОУ ВО СПбГПМУ Минздрава России от 05.04.24

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.

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

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Статья должна иметь (НА РУССКОМ И АНГЛИЙСКОМ ЯЗЫКАХ):

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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.
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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.

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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.

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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.

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Тезисы докладов, материалы научных конф.

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

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

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

Технология подготовки ссылок с использованием системы автоматической транслитерации и переводчика.

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

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

Примеры транслитерации русскоязычных источников литературы для англоязычного блока статьи

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

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

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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.

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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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Сайт журнала: http://www.gpmu.org/science/pediatrics-magazine/Medicine_organization.

ИЗДАТЕЛЬСТВО ПЕДИАТРИЧЕСКОГО УНИВЕРСИТЕТА ПРЕДСТАВЛЯЕТ

ОРТОПЕДИЧЕСКАЯ СТОМАТОЛОГИЯ. ПРОТЕЗИРОВАНИЕ НЕСЪЁМНЫМИ КОНСТРУКЦИЯМИ ЗУБНЫХ ПРОТЕЗОВ

М. Ф. Сухарев, С. Б. Фищев, М. Г. Рожкова

Учебник соответствует программе Министерства здравоохранения Российской Федерации по ортопедической стоматологии, предназначен и будет полезным для преподавателей курсов и стоматологических кафедр, студентов стоматологических факультетов, ординаторов, аспирантов, врачей-стоматологов.

Авторы будут признательны за критические замечания и дополнения.

Твердый переплет, цветные иллюстрации, 464 страницы.

Приобрести издание можно в интернет-магазине Лабиринт:
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ПАТОЛОГИЧЕСКАЯ АНАТОМИЯ. ОБЩИЙ КУРС

Р.А. Насыров, Д.О. Иванов, Н.М. Аничков, Е.Ю. Калинина

В общем курсе патологической анатомии (клинической патоморфологии) рассмотрены вопросы общей патологической анатомии: методы исследования в патоморфологии, повреждение и гибель клеток и тканей, в том числе старение; нарушения кровообращения и иных сред организма, воспаление, репарация и регенерация, заживление ран, иммунная патология, адаптация, патология роста клеток и их дифференцировки, опухоли, генетические заболевания, учение о диагнозе в патологической анатомии, патология и факторы окружающей среды, патология, вызванная питанием, констатация смерти и др.

Учебник рассчитан на студентов-медиков всех факультетов, а также на врачей, интересующихся вопросами общей патологической анатомии.

Твердый переплет, цветные иллюстрации, 280 страниц.

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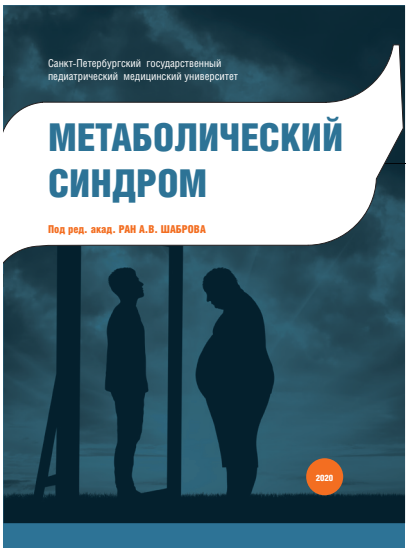
ИЗДАТЕЛЬСТВО ПЕДИАТРИЧЕСКОГО УНИВЕРСИТЕТА
ПРЕДСТАВЛЯЕТ

МЕТАБОЛИЧЕСКИЙ СИНДРОМ

Под ред. акад. РАН А.В. Шаброва



Монография посвящена одной из ведущих проблем современного здравоохранения — метаболическому синдрому. Представлены исторические аспекты изучения метаболического синдрома и ассоциированных с ним заболеваний сердечно-сосудистой системы, критерии диагностики, эпидемиологические данные, проанализирована роль таких факторов, как микробиом кишечника, адипокины, оксидативный стресс, нарушение пищевого поведения в патогенезе метаболического синдрома. Рассмотрено влияние метаболического синдрома на бронхолегочную патологию, гастроэнтерологическую патологию, половые дисфункции. Описаны перспективные методы обследования пациентов с метаболическим синдромом, современные подходы к терапии. Монография будет интересна врачам терапевтических специальностей, научным работникам, преподавателям, аспирантам, студентам медицинских вузов.

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ГОЛОДАНИЕ В ДЕТСТВЕ И БОЛЕЗНИ В СТАРОСТИ

Л.П. Хорошинина, Д.О. Иванов

Книга посвящена малоизученным медицинским проблемам у людей старших возрастных групп, переживших в детстве длительные периоды голодания. Авторами изучаются отдаленные последствия длительного голодания детей и подростков в блокированном Ленинграде (1941–1944). Литературный обзор и полученные данные свидетельствуют об особенностях соматических заболеваний у бывших малолетних жителей блокированного Ленинграда, ставших ныне взрослыми. Книга переиздается повторно, текст её дополнен и исправлен.

Издание может быть интересно патологам, врачам-клиницистам, специалистам по организации здравоохранения и всем гражданам, интересующимся историей блокады Ленинграда.

2-е издание, переработанное и дополненное.

Твердый переплет, 176 страниц.

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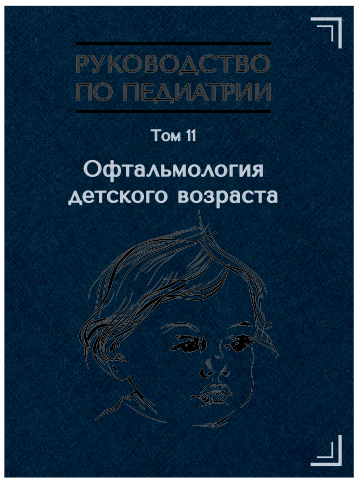
ИЗДАТЕЛЬСТВО ПЕДИАТРИЧЕСКОГО УНИВЕРСИТЕТА ПРЕДСТАВЛЯЕТ

Руководство по педиатрии. ОФТАЛЬМОЛОГИЯ ДЕТСКОГО ВОЗРАСТА

Редакционная коллегия тома: Д.О. Иванов, В.В. Бржеский



Том 11 «Руководства по педиатрии» отражает современный уровень развития офтальмологии детского возраста. Книга содержит актуальную информацию о современных методах диагностики и лечения заболеваний глаз у детей. Отдельные разделы посвящены клиническим рекомендациям по основным синдромам и заболеваниям.

Издание предназначено офтальмологам, педиатрам и представителям других медицинских дисциплин, а также студентам старших курсов медицинских вузов.

Твердый переплет, цветные иллюстрации, 344 страницы.

Приобрести издание можно в интернет-магазине Лабиринт:
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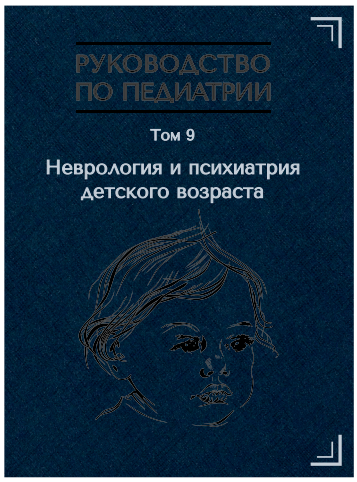
Руководство по педиатрии. НЕВРОЛОГИЯ И ПСИХИАТРИЯ ДЕТСКОГО ВОЗРАСТА

Редакционная коллегия тома: Д.О. Иванов, В.И. Гузева, С.В. Гречаный



Том 9 «Руководства по педиатрии» отражает современный уровень развития неврологии и психиатрии детского возраста. Книга содержит актуальную информацию о современных методах диагностики и лечения заболеваний нервной системы и психических расстройствах. Отдельные разделы посвящены клиническим рекомендациям по основным синдромам и заболеваниям.

Руководство предназначено неврологам, нейрохирургам, психиатрам, психотерапевтам и представителям других медицинских дисциплин, а также студентам старших курсов медицинских вузов.

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