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2024, ТОМ 9, № 3 НАУЧНО-ПРАКТИЧЕСКИЙ ЖУРНАЛ ДЛЯ ВРАЧЕЙ

МЕДИЦИНА И ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ

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AGE AS A SOCIO-BIOLOGICAL COMPONENT OF PERINATAL RISK IN PATIENTS OF THE PREGNANCY PATHOLOGY DEPARTMENT WHO OVERCAME INFERTILITY USING ART

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ABSTRACT. In order to assess medical and social characteristics, 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 assisted reproductive technologies (ART). It was found that among patients the proportion of women of late reproductive age was 2.1 times higher than that of early reproductive age, and the proportion of female infertility was 77.5%. In patients of late reproductive age, not only the age at which infertility was diagnosed was significantly higher (32.50±0.21 years 26.96±0.20 years, respectively), but also the average time required to achieve a positive result of infertility treatment using ART (7.01±0.08 years and 4.74±0.07 years). Despite the fact that the majority of patients were diagnosed with female infertility in the age range of 30–34 years (37.5%), and the diagnosis of female infertility associated with male factors was made at the age of 35–39 years (32.0%), there is no statistically significant difference between the average age of diagnosis of female and male infertility (30.71±0.22 years and 30.65±0.31 years) or in the ratio of female and male infertility within each age group. In patients 35 years of age and older, there was a significantly higher proportion of women whose pregnancy occurred after the fourth or more in vitro fertilization (IVF) cycle (21.6% versus 15.1%), for whom it was the third or more pregnancy (32.8% versus 22. 9%), as well as the second or more births (29.5% versus 9.8%; $p<0.05$). Women of late reproductive age had 1.6 times fewer medical abortions, spontaneous abortions, and negative perinatal outcomes compared to younger patients (62.2% versus 38.0%; $p<0.05$). Among patients in the older age group, complications caused by Covid or ARVI diseases were much less common while polyhydramnios, venous complications, as well as pregnancy complications associated with disturbances in the hemostatic system and uterine fibroids were more often observed. The study showed the absence of statistically significant differences in the structure of the main diagnoses upon admission to the pregnancy pathology department depending on the age of this group of patients. Thus, despite the fact that age, as a socio-biological factor of perinatal risk, has a significant impact on certain parameters of medical, social and clinical-statistical characteristics, for patients who have overcome infertility with the help of ART, this factor is not always decisive and, above all, it is necessary to take into account the woman's health status.

KEYWORDS: assisted reproductive technologies, infertility, Department of Pregnancy Pathology, medical and social characteristics

ВОЗРАСТ КАК СОЦИАЛЬНО-БИОЛОГИЧЕСКИЙ КОМПОНЕНТ ПЕРИНАТАЛЬНОГО РИСКА У ПАЦИЕНТОК ОТДЕЛЕНИЯ ПАТОЛОГИИ БЕРЕМЕННОСТИ, ПРЕОДОЛЕВШИХ БЕСПЛОДИЕ С ПОМОЩЬЮ ВРТ

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РЕЗЮМЕ. С целью оценки медико-социальной характеристики 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 среди пациенток доля женщин позднего репродуктивного возраста была в 2,1 раза выше, чем раннего, а доля женского бесплодия составила 77,5%. У пациенток позднего репродуктивного возраста был достоверно выше не только возраст постановки диагноза бесплодия (32,50±0,21 года и 26,96±0,20 года соответственно), но и средний срок, необходимый для достижения положительного результата лечения бесплодия с применением ВРТ (7,01±0,08 года и 4,74±0,07 года). Несмотря на то что у большинства пациенток диагноз «женское бесплодие» был поставлен в возрастном интервале 30–34 года (37,5%), а диагноз «женское бесплодие, связанное с мужскими факторами» — в возрасте 35–39 лет (32,0%), статистически достоверная разница отсутствует как между средним возрастом постановки женского и мужского бесплодия (30,71±0,22 года и 30,65±0,31 года), так и в соотношении женского и мужского бесплодия внутри каждой возрастной группы. У пациенток 35 лет и старше был достоверно выше удельный вес женщин, беременность которых наступила с четвертого и более цикла экстракорпорального оплодотворения (ЭКО) (21,6% против 15,1%), у которых это была третья беременность и более (32,8% против 22,9%), а также вторые роды и более (29,5% против 9,8%; $p<0,05$). У женщин позднего репродуктивного возраста было в 1,6 раза меньше абортов по медицинским показаниям, самопроизвольных абортов и негативных перинатальных исходов, чем у более молодых пациенток (38,0% против 62,2%; $p<0,05$). Среди пациенток старшей возрастной группы значительно реже встречались осложнения, обусловленные заболеваниями Ковид или ОРВИ, и чаще наблюдалось многоводие, венозные осложнения, а также осложнения беременности, связанные с нарушениями в системе гемостаза и миомой матки. Исследование показало отсутствие статистически значимых различий в структуре основных диагнозов при поступлении в отделение патологии беременности в зависимости от возраста у данного контингента пациенток. Таким образом, несмотря на то что возраст как социально-биологический фактор перинатального риска оказывает значимое влияние на отдельные параметры медико-социальной и клинико-статистической характеристики, для пациенток, преодолевших бесплодие с помощью ВРТ, данный фактор не всегда является определяющим, и прежде всего необходимо учитывать состояние здоровья женщины.

КЛЮЧЕВЫЕ СЛОВА: вспомогательные репродуктивные технологии, бесплодие, отделение патологии беременности, медико-социальная характеристика

INTRODUCTION

Negative trends in the demographic situation in Russia, observed in recent years, are largely determined by problems of reproduction [1]. The decline in a birth rate, which has been observed in our country since 2016, has a significant regional variability and directly depends on the climatic and geographical location of the territory, as well as the level of socio-economic well-being of the population living there [2, 3]. The Northwestern Federal District (NWFD) is among the federal districts with the lowest birth rate in Russia. The phenomenon of depopulation is becoming critical in the NWFD.

St. Petersburg, which is a separate constituent entity of the Russian Federation, is the largest contributor to the birth rate in the federal district. 50,437 children were born alive in the metropolis in 2022, which is 21.2% less than five years earlier, in 2018. At the same time, the number of births has been annually decreasing throughout the period from 2018 to 2022. The dynamics of the share of children born alive in St. Petersburg was assessed. Indicators in the total number of children born alive in the NWFD in 2018–2022 ranged from 44.0% in 2018 to 44.5% in 2022 (Fig. 1). Thereby it proves that the city greatly influences on the demographic situation in the whole federal district.

Nowadays, fighting for the life and health of each child becomes especially important under conditions of low birth rate [4]. Therefore, searching for a reserve to increase the birth rate in the country is particularly important [5, 6]. One of these reserves is assisted reproductive technologies (ART) [7, 8]. More than ten methods of ART are used in modern medical practice: in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), surrogate motherhood, reproductive donation, cryopreservation, etc. [9, 10]. However, the most common method is IVF.

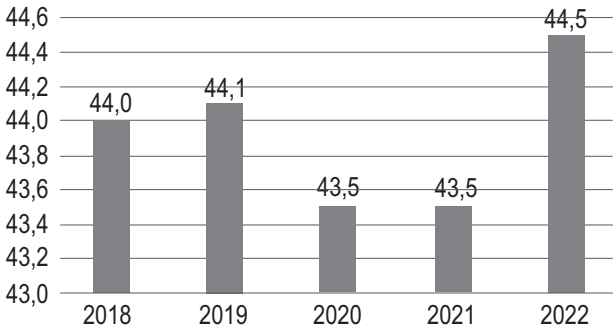

Fig. 1. Dynamics of the proportion of children born alive in St. Petersburg in the total number of live births in the Northwestern Federal District in 2018–2022 (in %)

Рис. 1. Динамика удельного веса детей, родившихся живыми в Санкт-Петербурге, в общем числе родившихся живыми в СЗФО в 2018–2022 годы (в %)

A significant number of St. Petersburg children born using IVF are born in perinatal centers of the city [11]. A lot of reasons contribute to this phenomenon, including maternal health and an obstetric history, which are largely related to the older age category of these women [12]. In addition, it is necessary to take into account subjective reasons due to special care for this category of pregnant women, laboring and delivery women [13]. Therefore, a significant number of pregnant women conceived with the help of ART are admitted for observation and treatment to the pregnancy pathology departments of perinatal centers [14, 15]. Thus, considering the role of such departments in providing medical care to women during pregnancy, age assessment as a factor of perinatal risk in patients of the pregnancy pathology department who overcame infertility with the help of ART is a relevant topic for research.

AIM

The aim of the research is to identify the way age effects on medical, social, clinical and statistical characteristics in patients of the Department of Pregnancy Pathology who overcame infertility by means of ART.

MATERIALS AND METHODS

This research was conducted at the Department of Pregnancy Pathology of the Perinatal Center 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. A special form “Card of medical and social examination of women suffering from infertility” was developed to assess characteristics of patients in the pregnancy pathology department who overcame infertility with the help of ART. Information from 820 record forms No. 003/u

"Medical card of a patient receiving medical care in inpatient conditions, in day care" was copied; these forms referred to patients of the pregnancy pathology department whose hospitalization ended with childbirth in the perinatal center of St. Petersburg State Pediatric Medical University in 2018–2024. Women permanently residing in St. Petersburg were selected for the study. All patients included in the sample underwent IVF.

In order to assess medical and social characteristics of the patients, all pregnant women were divided according to their age into patients of early (up to 35 years old) and late (35 years and older) reproductive age. Patients aged 50 years and older were categorized into the older age group — late reproductive age. All perinatal risk factors were evaluated according to the above-mentioned age groups, since pregnant woman older than 35 years are referred to higher social and biological risk factors according to the modern perinatal risk scale [13]. In addition to individual indicators of medical and social characteristics, the study assessed pregnancy complications and the structure of diagnoses at admission to the Department of Pregnancy Pathology of the Perinatal Center of St. Petersburg State Medical University [16]. A visibility index between the studied risk factors was calculated by assessing deviation of frequency of these factors in women of late reproductive age compared to women of early reproductive age.

Extensive indices, arithmetic weighted mean and its error were calculated. Obtained indicators were compared with official statistics. Significance of differences 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) software packages.

RESULTS AND DISCUSSION

Women in the age group 35–39 years constituted the largest proportion of the patients of the Department of Pregnancy Pathology who overcame infertility with the help of ART, 41.0% of them (Fig. 2). Women aged 40 years and older accounted for 26.9%, including 2.2% of women older than 50 years. Accordingly, the proportion of women of late reproductive age was 67.8% and early reproductive age 32.2% ($p < 0.05$).

Mean age of women in the early reproductive age group was 31.7±0.17 years (Table 1), while the mean age of women in the late reproductive age group was 39.51±0.17 years. Patients of late reproductive age were diagnosed with infertility at 32.50±0.21 years, which was significantly higher than the age of diagnosis in younger patients — 26.96±0.20 years ($p < 0.05$).

According to clinical guidelines, women under 35 years of age should start infertility treatment with ART one year after the absence of pregnancy in case there was no fertility limitations, and women older than 35 years of age — in six months [9]. Women in the early reproductive age group were diagnosed with infertility on average 4.74±0.07 years before a positive outcome and 7.01±0.08 years in the late group of pregnant women ($p < 0.05$).

The research showed that the proportion of patients suffering from female infertility was significantly higher than the proportion of patients whose infertility was due to male factors (77.5% vs. 22.5%; $p < 0.05$) (hereinafter referred to as male infertility). Most patients were diagnosed with female infertility between 30 and 34 years (37.5%). Male infertility was most often diagnosed at the age of 35–39 years (32.0%). The mean age of female infertility was 30.71±0.22 years and male infertility was 30.65±0.31 years ($p > 0.05$). It was found that

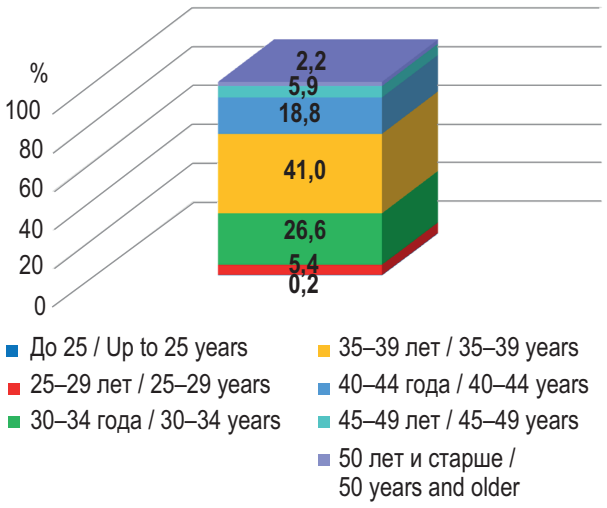

Fig. 2. Distribution of patients by age (% of total)

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

Table 1

Average age and age at diagnosis of infertility in groups of patients of early and late reproductive age

Таблица 1

Средний возраст и возраст постановки диагноза «бесплодие» в группах пациенток раннего и позднего репродуктивного возраста

Показатель / Index	Возраст / Age		Возраст постановки диагноза «бесплодие» / Age at diagnosis of infertility	
	Ранний репродуктивный возраст / Early reproductive age	Поздний репродуктивный возраст / Late reproductive age	Ранний репродуктивный возраст / Early reproductive age	Поздний репродуктивный возраст / Late reproductive age
Среднее значение / Average value	31,70	39,51	26,96	32,50
Стандартная ошибка / Standard error	0,15	0,17	0,20	0,21
Стандартное отклонение / Standard deviation	2,43	4,02	3,19	4,85
Дисперсия выборки / Sample variance	5,92	16,16	10,20	23,49
Минимум / Minimum	24	35	18	17
Максимум / Maximum	34	54	33	48

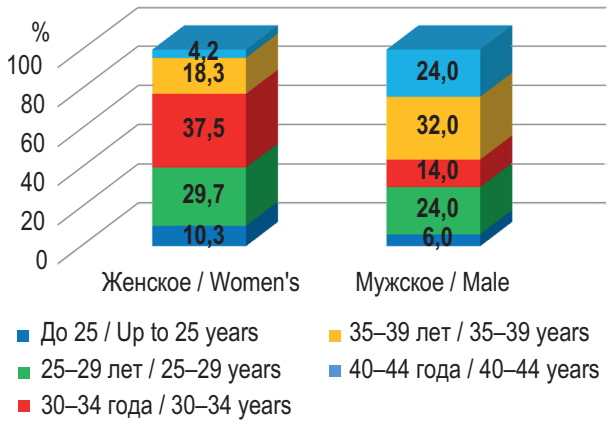

Fig 3. Distribution of patients by age of diagnosis of female and male infertility (in % of total)

Рис 3. Распределение пациенток по возрасту постановки диагнозов женское и мужское бесплодие (в % к итогу)

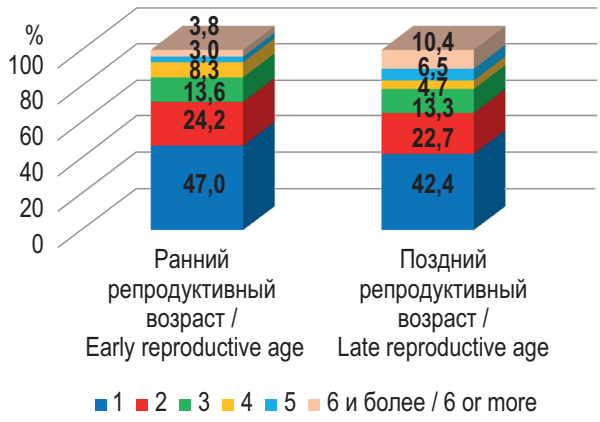

Fig. 4. Distribution of patients by number of births depending on age (% of total)

Рис. 4 Распределение пациенток по количеству процедур ЭКО в зависимости от возраста (в % к итогу)

the ratio of female to male infertility in women of early and late reproductive age had no statistically significant difference ($p < 0.05$). The distribution of patients by age of diagnosis of female and male infertility is presented in Figure 3.

Assessment of IVF infertility treatment distribution by the number of IVF procedures revealed that 47.0% of women of early reproductive age and 42.4% of women of late reproductive age became pregnant at the first attempt ($p > 0.05$). Moreover, in patients aged 35 years and older and patients under 35 years of age, there were no significant differences in pregnancy on the second (22.7% and 24.2%, respectively) and third (13.3% and 13.6%) IVF procedures between the groups ($p > 0.05$). It was revealed that the older reproductive group had a significantly higher proportion of women who became pregnant from the fourth IVF cycle or more (21.6% vs. 15.1%; $p < 0.05$) compared to younger patients. The distribution of patients by the number of IVF procedures depending on their age is shown in Figure 4.

The research showed that the majority of patients of both early and late reproductive age experienced their first pregnancy (Fig. 5). At the same time, the proportion of women with one or two pregnancies was significantly higher in the group of pregnant women under 35 years of age

(87.1% vs. 67.2%; p <0.05), and in the group 35 years and older, patients with a third pregnancy or more were statistically significantly more prevalent (32.8% vs. 22.9%; p <0.05).

The distribution of patients by the number of births depending on age was analyzed as well (Fig. 6). Patients of late reproductive age appeared to have significantly less frequent first births (70.5% vs. 90.2%; p <0.05) and more frequent second births or more (29.5% vs. 9.8%; p <0.05) compared to patients of early reproductive age.

On average, patients of late reproductive age had significantly higher (p <0.05) number of IVF procedures (2.68±0.10 vs. 2.08±0.08, respectively), pregnancies (2.22±0.05 vs. 1.60±0.06), and deliveries (1.35±0.03 vs. 1.14±0.03) compared to younger pregnant women. The average number of pregnancies, deliveries and IVF attempts in the groups of patients of early and late reproductive age is presented in Table 2.

At the same time, it was found that women of late reproductive age had significantly fewer

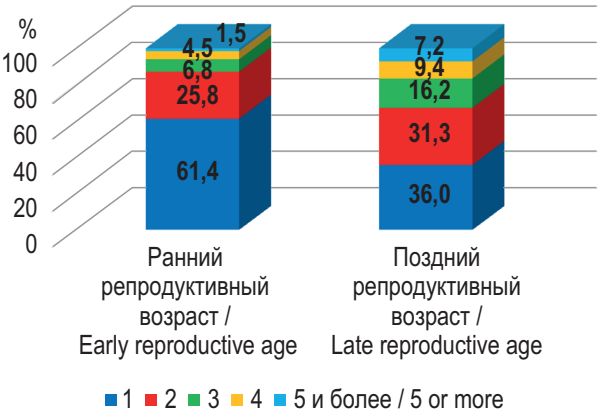

Fig. 5. Distribution of patients by number of pregnancies depending on age (% of the total)

Рис. 5. Распределение пациенток по количеству беременностей в зависимости от возраста (в % к итогу)

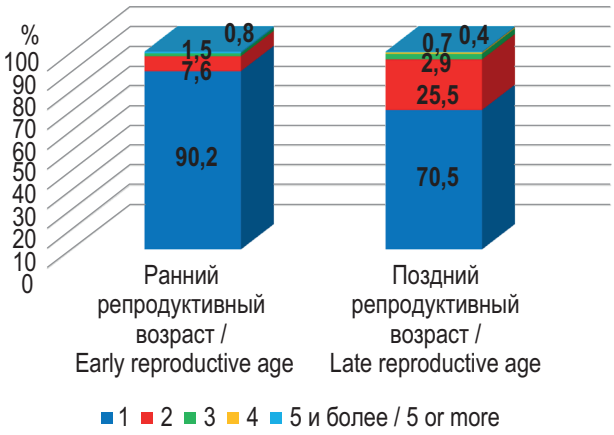

Fig. 6. Distribution of patients by number of births depending on age (% of total)

Рис. 6. Распределение пациенток по количеству родов в зависимости от возраста (в % к итогу)

Table 2

Average number of pregnancies, births and IVF attempts in groups of patients of early and late reproductive age

Таблица 2

Среднее количество беременностей, родов и попыток ЭКО в группах пациенток раннего и позднего репродуктивного возраста

Показатель / Index	Количество ЭКО / Number of IVF		Беременность / Pregnancy		Роды / Childbirth	
	Ранний репродуктивный возраст / Early reproductive age	Поздний репродуктивный возраст / Late reproductive age	Ранний репродуктивный возраст / Early reproductive age	Поздний репродуктивный возраст / Late reproductive age	Ранний репродуктивный возраст / Early reproductive age	Поздний репродуктивный возраст / Late reproductive age
Среднее значение / Average value	2,08	2,68	1,60	2,22	1,14	1,35
Стандартная ошибка / Standard error	0,08	0,10	0,06	0,05	0,03	0,03
Стандартное отклонение / Standard deviation	1,35	2,48	0,95	1,28	0,49	0,61
Дисперсия выборки / Sample variance	1,82	6,13	0,90	1,63	0,24	0,37
Минимум / Minimum	1	1	1	1	1	1
Максимум / Maximum	6	18	6	7	5	5

abortions and negative outcomes in their history than patients under 35 years of age (50.4% vs. 68.9%; p <0.05), although the proportion of abortions on women's request was higher (12.4% vs. 6.7%; p <0.05). Accordingly, the proportion of medically indicated abortions, spontaneous abortions, and negative perinatal outcomes was 1.6 times higher in younger patients (62.2% vs. 38.0%; p <0.05).

The majority of patients who overcame infertility with the help of ART in the Department of Pregnancy Pathology of the Perinatal Center received medical care paid for by the compulsory health insurance fund (92.4%), and it was significantly lower in patients under 35 years of age than in women 35 years and older (87.9% vs. 94.2%; p <0.05). Accordingly, among patients of late reproductive age, the proportion of those who received medical care within the framework of voluntary medical insurance (VMI) and from personal funds was 4.6 times lower than among patients of early reproductive age (5.8% vs. 26.5%; p <0.05).

Distribution of patients by marital status according to age revealed significant differences between the ratio of married and unmarried patients. There were fewer married women (92.1% vs. 97.7%; p <0.05) and more unmarried women (7.9% vs. 2.3%; p <0.05) among patients of late reproductive age compared to pregnant women of early reproductive age.

It was established (Table 3) that patients of late reproductive age had significantly fewer complications due to Covid's disease or acute respiratory

Table 3

Frequency of complications of pregnancy and childbirth in patients of the pregnancy pathology department depending on age (per 100 hospitalized)

Таблица 3

Частота осложнений беременности и родов у пациенток отделения патологии беременности в зависимости от возраста (на 100 госпитализированных)

Заболевание или патологическое состояние / Disease or pathological condition [14]	**Ранний репродуктивный возраст / Early reproductive age**	**Поздний репродуктивный возраст / Late reproductive age**	**Показатель наглядности / Visibility Score**	T
Миопия / Myopia (O99.8)	43,18±3,05	39,57±2,08	–8,4	0,95
Анемия / Anemia (O99)	36,36±2,97	39,93±2,08	9,8	0,98
Гестационный сахарный диабет / Gestational diabetes mellitus (O24)	27,27±2,75	32,01±1,98	17,4	1,40
Ковид или острые респираторные вирусные инфекции / Covid or acute respiratory viral infections (O98)	54,55±3,07	19,78±1,69	–63,7	9,92*
Преэклампсия средней тяжести и тяжелая / Moderate to severe preeclampsia (O14)	21,21±2,52	26,98±1,88	27,2	1,83
Заболевания щитовидной железы / Thyroid diseases (E00-E07)	31,06±2,85	37,41±2,05	20,4	1,81
Заболевания мочеполовой системы / Diseases of the genitourinary system (O23)	24,24±2,64	27,34±1,89	12,8	0,95
Истмико-цервикальная недостаточность / Isthmic-cervical insufficiency (O34.4)	13,64±2,12	13,67±1,46	0,2	0,01
Маловодие / Malovodie (O41)	5,30±1,38	5,04±0,93	–5,0	0,16
Многоводие / Polyhydramnios (O40)	1,52±0,75	4,68±0,90	208,6	2,29*
Венозные осложнения / Venous complications (O22)	18,18±2,38	26,26±1,87	44,4	2,27*
Нарушение в системе гемостаза / Disturbance in the hemostasis system (O99.1)	12,12±2,01	21,22±1,74	75,1	3,42*
Патология плаценты / Pathology of the placenta (O44)	17,42±2,34	19,06±1,67	9,4	0,57
Миома матки / Uterine fibroids (O34.1)	6,82±1,55	21,94±1,76	221,8	6,45*
Прочие заболевания / Other diseases	52,27±3,08	49,28±2,12	–5,7	0,60

* Статистически достоверная разница между группами (p<0,05). / Statistically significant difference between groups (p<0.05).

Table 4

Structure of diagnoses upon admission of patients to the pregnancy pathology department depending on age (%)

Таблица 4

Структура диагнозов при поступлении пациенток в отделения патологии беременности в зависимости от возраста (%)

Диагноз при поступлении / Diagnosis on admission	Ранний репродуктивный возраст / Early reproductive age	Поздний репродуктивный возраст / Late reproductive age	Показатель наглядности / Visibility Score	T
Кесарево сечение / Cesarean sectio (O82, O84.2)	43,2 ± 3,05	49,6 ± 2,12	15,0	1,73
в том числе кесарево сечение экстренное / including emergency caesarean section	9,8 ± 1,84	7,2 ± 1,10	–27,0	1,24
Преждевременные роды / Premature birth (O60)	13,6 ± 2,12	15,8 ± 1,55	16,1	0,93
Преэклампсия средней тяжести и тяжелая / Moderate to severe preeclampsia (O14)	9,1 ± 1,77	9,4 ± 1,24	2,9	0,12
Срочные роды / Urgent birth (O80)	12,9 ± 2,07	11,2 ± 1,34	–13,4	0,70
Истмико-цервикальная недостаточность / Isthmic-cervical insufficiency (O34.4)	2,3 ± 0,92	3,2 ± 0,75	42,4	0,81
Плацентарная недостаточность / Placental insufficiency (O43)	3,8 ± 1,18	2,5 ± 0,67	–33,5	0,94
Преждевременное излитие околоплодных вод / Premature rupture of amniotic fluid (O42)	3,0 ± 1,06	1,4 ± 0,51	–52,5	1,36
Предлежание плаценты без кровотечения / Placenta previa without bleeding (O44)	1,5 ± 0,75	1,1 ± 0,44	–28,8	0,50
Ложные схватки / False contractions (O47)	2,3 ± 0,92	0,4 ± 0,25	–84,2	2,0*
Вакуум-экстракция плода / Vacuum extraction of the fruit (O81)	1,5 ± 0,75	0,7 ± 0,36	–52,5	0,95
Прочие / Others	6,8 ± 1,55	4,7 ± 0,90	–31,4	1,19

* Статистически достоверная разница между группами ($p < 0,05$). / Statistically significant difference between groups ($p < 0.05$).

infections ($p < 0.05$). At the same time, patients in this age group were more likely to have gynecological and venous complications, as well as pregnancy complications related to disorders in the hemostasis system and uterine myoma ($p < 0.05$). The research demonstrated that there was no statistically significant difference between the incidence of myopia, anemia, gestational diabetes mellitus, preeclampsia, placental pathology, low water supply, thyroid and genitourinary diseases in patients of early and late reproductive age ($p > 0.05$).

At the same time, no statistically significant differences were found between the proportion of cesarean section, preterm labor, moderate and severe preeclampsia, term labor, placental and isthmic-cervical insufficiency, premature amniotic fluid shedding, placenta previa without bleeding, and vacuum extraction of the fetus ($p > 0.05$) (Table 4). However, only the proportion of false contractions in women of late reproductive age was statistically significantly lower than in younger patients ($p < 0.05$).

CONCLUSIONS

1. The proportion of women of late reproductive age was 2.1 times higher in pregnancy pathology department, and the proportion of female infertility amounted to 77.5%.

2. Patients of late reproductive age had a significantly higher age of diagnosis of infertility (32.50±0.21 years and 26.96±0.20 years, respectively), as well as the average time required to achieve a positive result of infertility treatment using ART (7.01±0.08 years and 4.74±0.07 years).

3. Despite the fact that the majority of patients were diagnosed with female infertility in the age range of 30–34 years (37.5%) and female infertility associated with male factors was diagnosed at the age of 35–39 years (32.0%), there was no statistically significant difference both between the mean age of diagnosis of female and male infertility (30.71±0.22 years and 30.65±0.31 years) and

in the ratio of female to male infertility within each age group.

4. Regardless of age, most of the patients became pregnant with their first IVF attempt, it was their first pregnancy and first delivery. However, the proportion of women who became pregnant on their fourth IVF cycle or more (21.6% vs. 15.1%), their third pregnancy or more (32.8% vs. 22.9%), and their second birth or more (29.5% vs. 9.8%; $p < 0.05$) was significantly higher in patients 35 years and older.

5. On average, patients of late reproductive age had significantly more IVF procedures (2.68±0.10 vs. 2.08±0.08, respectively), pregnancies (2.22±0.05 vs. 1.60±0.06), and deliveries (1.35±0.03 vs. 1.14±0.03) compared to younger pregnant women.

6. Women of late reproductive age had 1.6 times fewer medically indicated abortions, spontaneous abortions, and negative perinatal outcomes than younger patients (62.2% vs. 38.0%; $p < 0.05$).

7. Among patients of late reproductive age, the proportion of women who received medical care under VMI and from personal funds was 4.6 times lower, and the proportion of unmarried women was 3.4 times higher than among patients of early reproductive age.

8. Patients of late reproductive age had significantly less frequent complications due to Covid's disease or acute respiratory viral infections and more frequent gynecological, venous complications, as well as pregnancy complications related to disorders in the hemostasis system and uterine myoma. At the same time, there was no significant difference in the incidence of myopia, anemia, gestational diabetes mellitus, pre-eclampsia, placental pathology, low water supply, thyroid and genitourinary diseases.

9. Besides the specific weight of false labor, the proportion of which was higher in pregnant women under 35 years of age, statistically significant differences depending on age in the structure of the main diagnoses at the admission of patients who overcame infertility with the help of ART to the department of pregnancy pathology were not established.

Hence, in spite of the fact that age, being a social and biological factor of perinatal risk, has a significant impact on some parameters of medical and social clinical and statistical characteristics, the study showed that, first of all, it is necessary to take into account a woman's state of 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.

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

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THE PERCEIVED POSTPARTUM STRESS AND ITS PREDICTORS

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ABSTRACT. The article presents the empirical study results of the perceived stress level and its predictors in women after childbirth. The study sample consisted of 57 women who were interviewed under inpatient care in a maternity facility on the 3rd day after delivery at 37–40 gestational weeks of single pregnancy. Psychodiagnostic methods were used: the authors' original questionnaire, the Perceived Stress Scale-10, the Perinatal Anxiety Screening Scale (PASS-R), and the Edinburgh Postpartum Depression Scale. The respondents were divided into two comparison groups according to the "Overexertion" subscale (measures the subjectively perceived level of tension and stress level) of the "Perceived stress Scale — 10" method. In the early postpartum period, a high level of perceived stress was found in 38.6 % of women in the sample. Women with high levels of postpartum stress are characterized by moderate levels of general anxiety and mild symptoms of postpartum depression. Half of the women in this group in the first days after delivery noted the presence of difficulties with breastfeeding. In general, the overwhelming majority of women in the sample highly rated their own prior awareness of the specifics of delivery and pain management during delivery. They also highly rated the quality of interaction with doctors during delivery and were satisfied with this interaction and contact with doctors. Predictors of perceived stress were perinatal anxiety, symptoms of postpartum depression, as well as prior awareness of the specifics of delivery (clarity of information about the criteria for prescribing a caesarean section and the potential probability of performing this surgical intervention; clarity and completeness of information about methods, opportunities and limitations of pain relief in delivery).

KEYWORDS: postpartum stress, delivery, perinatal anxiety, postpartum depression, awareness

ВОСПРИНИМАЕМЫЙ СТРЕСС ПОСЛЕ РОДОВ И ЕГО ПРЕДИКТОРЫ

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РЕЗЮМЕ. В статье представлены результаты эмпирического исследования уровня воспринимаемого стресса и его предикторов у женщин после родов. Выборку исследования составили 57 женщин, которые были опрошены в условиях стационарного наблюдения в учреждении родовспоможения на 3-и сутки после родов на сроке 37–40 гестационных недель одноплодной беременности. Использовались психодиагностические методы: авторская анкета, «Шкала воспринимаемого стресса — 10» (The Perceived Stress Scale — 10), Скрининговая шкала перинатальной тревоги (Perinatal Anxiety Screening Scale, PASS-R), Эдинбургская шкала послеродовой депрессии. Респондентки были разделены на две группы сравнения по данным субшкалы «Перенапряжение» (в соответствии с уровнем субъективно воспринимаемой напряженности ситуации) по методике «Шкала воспринимаемого стресса — 10». В послеродовом периоде высокий уровень воспринимаемого стресса был выявлен у 38,6% женщин в выборке. Для женщин с высоким уровнем стресса после родов характерны средний (умеренный) уровень общей тревоги, наличие слабовыраженных симптомов послеродовой депрессии. Половина женщин данной группы в первые дни после родов отмечали наличие сложностей с грудным вскармливанием ребенка. В целом подавляющее большинство женщин выборки высоко оценивали собственную предварительную информированность об особенностях родоразрешения и обезболивания в родах. Они также высоко оценивали качество и уровень собственной удовлетворенности взаимодействием с врачами в процессе родов. Предикторами воспринимаемого стресса выступили перинатальная тревога, симптомы послеродовой депрессии, а также предварительная информированность об особенностях родоразрешения (понятность информации о критериях назначения операции кесарева сечения и потенциальной вероятности проведения данного хирургического вмешательства; понятность и полнота информации о методах, возможностях и ограничениях применения обезболивания в родах).

КЛЮЧЕВЫЕ СЛОВА: послеродовый стресс, роды, перинатальная тревога, послеродовая депрессия, информированность

INTRODUCTION

Comprehensive all-round support of a woman giving birth is one of the priority directions of modern healthcare in Russia. Despite the fact that childbirth is a physiological process for a woman's body, it can be associated with a number of psychological and emotional difficulties. Domestic and foreign studies show that a significant percentage of women perceive childbirth as a traumatic event. Approximately 3% of women develop posttraumatic stress disorder (PTSD) after childbirth, with others reporting multiple symptoms that do not meet all the criteria necessary to confirm this diagnosis [1–6]. Although increased stress levels are somewhat normal in the postpartum period [7], excessive stress poses a serious threat to the well-being of mothers and their infants [8, 9–12]. Expressed stress affects neural regulation of mothers' emotions, and can have negative consequences for their adaptation to parenthood [13] and become a major factor in dysfunctional motherhood [14–16], leading to poor quality child care and neglect. The most negative consequences for the mother-child dyad are pronounced postpartum stress in women, which is observed during 4–12 weeks after childbirth [14–17]. At the same time, a number of researchers note that any degree of severity and duration of postpartum stress have an impact on the child's development and mental health after the three-month period during which the stress occurred [18–20].

In 2020, A. Oyetunji and P. Chandra conducted a systematic review of 74 foreign studies carried out between 1995 and 2019, which showed that maternal postpartum stress is negatively associated with the dynamics of psychophysical development of the child: growth deficit, delayed cognitive and speech development, reduced indicators of the development of large and fine motor skills of the child in the first year of life [21]. Expressed maternal stress after childbirth was associated with poor sleep of the child in the first year of life: a longer process of falling asleep and the frequency of night awakenings [22]. Postpartum stress also brings a number of difficulties in breastfeeding. Mothers who have anxiety-depressive symptoms in the postpartum period and who are exposed to significant stress were more likely to experience breastfeeding problems in the first 6–8 weeks after delivery [23]. On the one hand, postpartum stress

reduces maternal adherence to breastfeeding [24, 25], on the other hand, the composition of breast milk itself changes under the influence of stress hormones [26]. These consequences of stress justify the need for continuous professional support of breastfeeding mothers in a hospital postpartum unit and in the first days after discharge from a maternity hospital [27].

Although researchers have paid close attention to the problem of postpartum stress in women, the issue of determining its predictors remains open. Common predictors of maternal stress in the postpartum period are the experience of one or two births, low level of education, specific preferences for gender of a future child, and low level of social support [28, 29]. Motherhood experience has mixed results on postpartum stress [30]. S. Nakić Radoš et al. showed that first-time mothers have higher rates of postpartum stress only regarding the care for a newborn, which can be objectively reduced by assisting of medical personnel in a postpartum unit [31]. Higher satisfaction of pregnant women with their partner relationship and marriage in general is associated with low levels of postpartum stress [32].

Assessment of types of labor demonstrated no definite impact on stress after childbirth. In general, the type of delivery does not affect women's levels of stress and anxiety. However, on average, women who delivered naturally had higher levels of overt and covert anxiety than women who underwent cesarean section [33].

The apparent assumption that stress after childbirth is associated with anxiety-depressive symptoms has triggered many interdisciplinary studies. However, it has not led to a resolution of the causal relationship between these phenomena [34]. Nevertheless, perinatal anxiety, which is caused by mother's worries about childbirth and well-being, appeared to be closely related to a level of perceived stress after childbirth [35, 36].

A promising area of research is identifying links between postpartum stress and a woman's dissatisfaction with the quality of interaction with medical staff of an obstetric care facility [37–39]. Informational and psychological support of a woman by the medical staff of a maternity hospital is an important component of a woman's psychological readiness for labor, and can also be a factor that reduces the risk of a pronounced stress reaction to childbirth [40, 41]. The need for information support for pregnant women is also reflected in clinical recommendations for the delivery of singleton births by cesarean section and spontaneous labor [42, 43]. In this case, the timeliness and balance of information on peculiarities of delivery and possibilities of anesthesia during labor. In addition, it is also important to provide information on the course of the postpartum period, organization of care and feeding of a neonate. Relevance and multifactorial nature of postpartum stress determines the need for a thorough study of objective and subjective indicators affecting women in the postpartum period.

AIM

The aim of this research is to identify predictors of perceived stress in women in the postpartum period under inpatient observation in an obstetric care facility. The hypothesis was based on an assumption that predictors of perceived stress in women in the postpartum period (on the 3rd day after delivery) are symptoms of postpartum depression and perinatal anxiety, as well as subjective assessment of awareness of delivery peculiarities.

MATERIALS AND METHODS

Organization of the research. Empirical data were collected on the basis of the Perinatal Center of SPbSPMU. The research project was approved by the Local Ethical Committee of SPbSPMU of the Ministry of Health of Russia (protocol No. 3/13 of March 23, 2020). All respondents were patients of the Obstetrics Department, all women were transferred to the department after delivery. All women volunteered to participate in the study and gave their informed consent. On the 3rd day after delivery, respondents were asked to answer the questions of a research psychologist and to fill out questionnaires. The survey was conducted once. Individual participation results and psychologist consultation were provided to women upon request.

Sampling. 57 women aged 24 to 42 years (mean age 32±4.2 years) who delivered at 37 to 40 gestational weeks constituted an empirical sample of the research. All women had singleton pregnancies. All respondents denied having a history of mental health disorders. In order to analyze the predictors of stress in the postpartum period, the sample was divided into two comparison groups using the questionnaire

"The Perceived Stress Scale — 10" (The Perceived Stress Scale — 10 in the adaptation of Ababkov V.A. et al., 2016), which includes two subscales "Overstress" and "Counteracting Stress". The "Overstress" subscale measures a subjectively perceived level of tension (stress level) and was taken as a criterion forming comparison groups. The first group of women with a high level of perceived stress included 22 respondents with 17 to 25 scores according to this subscale. The second group of women (with a low level of perceived stress) consisted of 35 participants with scores ranging from 7 to 16. Half of the respondents in each comparison group were first-time mothers. Assisted reproductive technologies were used to achieve pregnancy in 9% of cases in the first group and in 11% of cases in the second group. Women with a high level of stress after childbirth were twice as likely to have various chronic diseases as women with a low level of stress. About one-third of the respondents in each comparison group had various pregnancy aggravations, such as gestational diabetes mellitus, moderate preeclampsia, and gestational hypothyroidism.

The vast majority of respondents in both groups stayed together with newborns in the hospital after childbirth by the time they participated in the research (86% and 91%, respectively). In other cases, a baby was temporarily placed in a neonatal observation ward due to careful monitoring of a mother's somatic condition. The mean Apgar scores at the 1st and 5th minutes after birth were 7.6±1 and 8.7±1, respectively, in the first group, and 7.8±0.4 and 8.9±0.3 in the second group. In the first days after delivery, 50% of the women in the first group and 29% of the women in the second group experienced various difficulties in breastfeeding ($p \leq 0.05$)."

Methods. Collection of clinical-anamnestic and social and demographic data was carried out by analyzing medical records (history of childbirth), filling out an author's questionnaire (Korgozha M.A., Shulga A.A.) and answering qualifying questions of the psychologist-researcher. The questionnaire contained a separate block of questions aimed at studying women's retrospective assessment of their own awareness before childbirth. These questions included information about the course of labor and peculiarities of the postpartum period, the probability and criteria for the appointment of cesarean section surgery, methods of anesthesia in labor, and possibilities and limitations of its use. Information about personal expectations of childbirth during pregnancy and attitudes regarding interaction with doctors during delivery was also specified. Each question was quantified on a 10-point scale to facilitate data processing. Standardized psychological questionnaires were also offered to respondents:

- Perceived Stress Scale — 10 (PSS-10, adapted by Ababkov V.A. et al., 2016) was used to measure a subjectively perceived level of tension of the actual situation and a person's level of effort to overcome this situation.
- Perinatal anxiety screening scale (PASS-R, adapted by Korgozhi M.A., Evmenenko A.O., 2021) was used for self-assessment of anxiety symptoms in women in the postpartum period.
- Edinburgh Postnatal Depression Scale (EPDS, adapted by Golubovich V.V., 2003) was used to identify and assess the level of postpartum depressive symptoms.

Mathematical processing of the data was carried out using IBM SPSS Statistics 26 program. The nonparametric method of comparison of mean Mann–Whitney, Pearson's χ^2 and linear regression analysis using the input method were applied.

RESULTS AND DISCUSSION

Analysis of the stress level experienced by mothers on the 3rd day after childbirth showed that 38.6% of the participants reported a high level of stress after childbirth. At the same time, the respondents of both comparison groups have average normal indicators according to the stress counterchange index level. However, women with high levels of perceived stress coped with stress worse compared to women with minimal levels of this indicator (9.68±2.64 and 7.8±2.55 points respectively, $p \leq 0.05$). On average, women with high levels of perceived stress had significantly higher scores of anxiety and depression in the postpartum period (Table 1). On average, the PASS-R total score revealed moderate levels of anxiety in women with high levels of perceived stress. This result indicates the presence of persistent symptoms of anxiety affecting the process of adaptation during the postpartum period, potentially redu-

cing the quality of life, as well as the presence of a moderate risk of developing anxiety disorder in women of this group. It is important to pay attention to significant differences in the symptoms of perinatal anxiety among women of the first and second groups ($p \leq 0.01$). Thus, in the first few days after childbirth, women with high levels of perceived stress are characterized by pronounced anxiety about childbirth and its impact on the child's health and well-being. Symptoms of postpartum depression were also more pronounced in women with high levels of perceived stress ($p \leq 0.001$). It is important to note that, although the average level of depression symptoms in the women of the first group on the 3rd day after delivery was 8.23±5.3 points with a diagnostic criterion of depression of 9–10 points, this category of women may represent a group of moderate risk of developing postpartum depression and should receive additional help from mental health professionals.

Examination of social demographic characteristics and clinical and anamnestic data of the patients revealed no significant differences between comparison groups, which reduces the likelihood of their influence on the level of perceived stress after childbirth ($p > 0.05$). No significant differences were also detected between comparisons on the scales of the author's questionnaire ($p > 0.05$).

Fifty-nine percent of the women in the first group and 71% of the women in the second group delivered through natural labor. The main reasons for cesarean section delivery were poor

Table 1

The level of severity of anxiety and depressive symptoms in women in the early postpartum period (in comparison groups)

Таблица 1

Уровень выраженности тревожной и депрессивной симптоматики у женщин в раннем послеродовом периоде (в группах сравнения)

Показатели шкал и субшкал / Indicators of scales and subscales	**Женщины с высоким уровнем воспринимаемого стресса (n = 22) / Women with high perceived stress (n = 22)**		**Женщины с низким уровнем воспринимаемого стресса (n = 35) / Women with low perceived stress (n = 35)**		**Показатель различий / Difference score**
	Среднее / Mean	**Стандартное отклонение / Standard deviation**	**Среднее / Mean**	**Стандартное отклонение / Standard deviation**	**U-критерий Манна–Уитни / Mann–Whitney U test**
PASS-R: Общий балл / PASS-R: Total score	32,77	12,09	18,00	9,25	645,0***
PASS-R: Острая и навязчивая тревога / PASS-R: Acute and obsessive anxiety	11,59	5,23	5,23	5,01	649,5***
PASS-R: Социальная тревога / PASS-R: Social anxiety	2,09	2,29	0,91	1,98	525,5*
PASS-R: Навязчивый перфекционизм / PASS-R: Obsessive perfectionism	7,86	3,68	4,57	3,40	573,0**
PASS-R: Специфические страхи (перинатальная тревога) / PASS-R: Specific fears (perinatal anxiety)	8,27	3,65	5,63	3,05	547,5**
PASS-R: Проблемы адаптации (диссоциация) / PASS-R: Adaptation problems (dissociation)	2,32	1,73	1,20	1,28	528,5*
PASS-R: Фобия / PASS-R: Phobia	0,64	0,73	0,46	0,74	452,0
Эдинбургская шкала послеродовой депрессии / Edinburgh Postnatal Depression Scale	8,23	5,30	4,26	3,65	579,5***

* Уровень значимости $p \leq 0,05$; ** уровень значимости $p \leq 0,01$; *** уровень значимости $p \leq 0,001$.
* Significance level $p \leq 0,05$; ** significance level $p \leq 0,01$; *** significance level $p \leq 0,001$.

labor activity and uterine scar failure in cases of repeated delivery. Half of the respondents in the second group expected that an emergency caesarean section might be required during delivery, while about one-third of the respondents in the first group (36% of the group) expected such a situation. At the same time, when asked "Do you think you were prepared for such a situation? (regardless of how the delivery was performed)", the affirmative answer was more common in the first group than in the second (77 and 66%, respectively). In both comparison groups, women rated their own prior knowledge of cesarean section surgery at an average level (6.7±3.7 and 6.8±3.7 points, respectively, $p > 0.05$). Women rated comprehension of information about the criteria for cesarean section surgery and the potential likelihood of this surgical procedure higher (7.9±3.1 and 7.2±3.6 points, respectively, $p > 0.05$).

Epidural analgesia was used during labor in 36% of women in group 1 and 37% of women in group 2. Spinal analgesia during cesarean section was used in 32% of women in the first group and in 23% of women in the second group. General anesthesia for cesarean section was used in 5% of women in group one and 3% of women in group two. Postoperative transverse abdominal space blockade was used for a total of three women from the total sample. Mean score of completeness of their own prior knowledge of anesthesia in labor was 6.6±3.8 for women in the first group and 7.8±2.9 in the second group. At the same time, the average level of comprehension concerning pain management was moderately high and amounted to 7.8±3.3 points for women in the first group and 7.9±3.1 points for women in the second group. About half of the respondents in both groups indicated that they were given a choice of anesthesia during labor. Respondents in both groups highly rated confidence in their choice of anesthesia in labor (8.5±2.0 and 8.4±2.9 points, respectively). Regardless of perceived stress level, on average, women rated their satisfaction with pain relief in labor highly (8.7±1.9 points in group 1 and 8.7±2.3 points in group 2, $p > 0.05$).

The results also showed that, on average, women with different levels of perceived stress expected close contact in interaction with doctors during labor (9.0±1.7 and 8.0±2.3 points in the first and second groups, respectively, $p > 0.05$). It is important to note that women in both comparison groups had higher personal expectations of the closeness of contact and quality of interaction with physicians during labor (9.3±1.7 and 9.0±2.3 points in the first and second groups, respectively, $p > 0.05$). Despite the level of perceived stress in the postpartum period, women rated this close contact with the physician as comfortable and sufficient. It is also important to note that women's average degree of satisfaction with the professional actions of physicians during labor was high and amounted to 9.7±0.8 points in the first group and 9.3±1.6 points in the second group ($p > 0.05$).

To identify predictors of perceived stress after delivery, linear regression analysis using the input method was performed, resulting in a regression equation (Table 2).

PASS-R (beta coefficient 0.45, $p \leq 0.001$) was the most significant predictor of the level of perceived stress in the postpartum period, as measured by PASS-R (beta coefficient 0.45, $p \leq 0.001$). A predictive ability of this indicator is increased by combining it with a range of conditions. Among them there are the severity of symptoms of postpartum depression, subjective assessment of the completeness of one's own prior knowledge of the methods of anesthesia in labor and the comprehensibility of this information, as well as the assessment of the comprehensibility of information about the cesarean section operation. The combination of all these indicators explains 45.7% of variance and has a high level of F — Fisher's criterion (8.57, $p=0.001$).

Thus, the results of the empirical research have shown that psychological indicators of a woman's emotional state (symptoms of postpartum depression and anxiety related to the situation of childbirth) primarily influence the level of perceived stress after childbirth in women. Postpartum stress also additionally depends on the degree of women's prior knowledge of peculiarities of labor and anesthesia in labor, as well as on the quality of interaction with medical personnel in the conditions of receiving inpatient care. The data obtained indicate the need to organize comprehensive medical and psychological care in obstetric care institutions, taking into account the control of identified factors affecting postpartum stress in female patients.

CONCLUSION

Women with high levels of perceived stress in the postpartum period had significantly high

Table 2

Regression analysis results

Таблица 2

Результаты регрессионного анализа

Уравнение регрессии / Regression equation	Критерий значимости (F) / Significance test (F)	Коэффициент детерминации (R^2) / Determination coefficient (R^2)
0,452 Перинатальная тревога* + 0,222 Депрессия – 0,109 Понятность информации об обезболивании – 0,091 Полнота информации об обезболивании – 0,039 Понятность информации о кесаревом сечении + 1,973 / 0,452 Perinatal Anxiety* + 0,222 Depression – 0,109 Clarity Information About Pain Management – 0,091 Completeness Information About Pain Management – 0,039 Clarity Information About Caesarean Section + 1,973	F = 8,572 p < 0,001	45,7 %

* Уровень значимости p ≤ 0,001. / Significance level p ≤ 0,001.

rates of anxiety, moderate rates of postpartum depression symptoms, and experienced various problems with breastfeeding during the first days of hospitalization more often than women with low levels of perceived stress.

In general, women highly valued their own prior knowledge of labor and pain management in labor, regardless of the severity of perceived stress after delivery. They also highly rated the quality of interactions with physicians during labor.

Women's perinatal anxiety, symptoms of postpartum depression, as well as preliminary awareness of the peculiarities of delivery (comprehensibility of information about cesarean section and potential probability of this surgical intervention; comprehensibility and completeness of information about the me thods, possibilities and limitations of anesthesia in labor) are main predictors of perceived stress in the postpartum period in an obstetric care facility.

ADDITIONAL INFORMATION

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

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

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

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

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

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

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ANALYSIS OF CASES OF MATERNAL NEAR-MISS IN THE RUSSIAN FEDERATION FOR 2021–2023 ACCORDING TO THE MATERNAL NEAR-MISS REGISTER

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ABSTRACT. The maternal near-miss Register (MNM Register) has been a source of personalized and aggregated data on obstetric "near-miss" cases in Russia since 2021. Purposes and tasks: to analyze obstetric "near-miss" cases in Russia from 2021 to 2023. For the analysis, data from the analytical block of the MNM Register on cases for 2021-2023 were used. The MNM Register started with 8,249 cases in 2021. At the peak of the COVID-19 pandemic, up to 230 patients were monitored daily. The frequency of mechanical ventilation and especially extracorporeal membrane oxygenation decreased sharply after the change of the SARS-CoV-2 Delta to Omicron (early 2022). Changes in the characteristics of obstetric "near-miss" cases are associated with the end of the pandemic — in 2023, there were practically no obstetric «near-miss» cases caused by COVID-19. There has been a twofold increase in telemedicine consultations with the Federal State Budgetary Institution "NMIC AGP named after V.I. Kulakov" of the Ministry of Health of Russia on obstetric "near-miss" cases issues for 2021–2023, associated with an overall increase in consultations and an increase in discipline for their registration in the MNM Register. Changes in 2023 compared to 2021 and 2022 in the general statistics and characteristics of obstetric "near-miss" cases are associated with the end of the COVID-19 pandemic, the end of the formation of obstetric "near-miss" cases notification system, the adjustment of the work of regional obstetric remote consultation centers and telemedicine centers.

KEYWORDS: maternal near-miss, severe maternal morbidity, maternal mortality, digital medicine, VIMIS "AKiNEO"

АНАЛИЗ СЛУЧАЕВ КРИТИЧЕСКИХ АКУШЕРСКИХ СОСТОЯНИЙ В РОССИЙСКОЙ ФЕДЕРАЦИИ ЗА 2021–2023 ГОДЫ ПО ДАННЫМ РЕГИСТРА КРИТИЧЕСКИХ АКУШЕРСКИХ СОСТОЯНИЙ

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РЕЗЮМЕ. Регистр критических акушерских состояний (далее — Регистр КАС) является источником персонифицированных и агрегированных данных по случаям КАС в Российской Федерации с 2021 года. Цель работы — проведение анализа случаев КАС в Российской Федерации с 2021 по 2023 годы. Для анализа использовались данные аналитического блока регистра КАС по случаям за 2021–2023 годы. Регистр КАС стартовал с 8249 случаев КАС в 2021 году. На пике пандемии COVID-19 под наблюдением ежедневно находились до 230 пациенток. Частота применения искусственной вентиляции легких и особенно экстракорпоральной мембранной оксигенации резко снизилась после смены штамма вируса дельта-варианта SARS-CoV-2 на омикрон (начало 2022 года). Изменения в характеристиках случаев КАС связаны с окончанием пандемии: в 2023 году практически не регистрировались случаи КАС, вызванные COVID-19. Отмечается двукратный рост телемедицинских консультаций с ФГБУ «НМИЦ АГП им. В.И. Кулакова» Минздрава России по вопросам КАС за 2021–2023 годы, связанный как с общим увеличением консультаций, так и повышением дисциплины по их фиксации в Регистре КАС. Изменения в 2023 году по сравнению с 2021 и 2022 годами в общей статистике и характеристике случаев КАС связаны с окончанием пандемии COVID-19, окончанием формирования полноценной системы оповещения о случае КАС, настройкой работы акушерских дистанционных консультативных центров и центров телемедицины.

КЛЮЧЕВЫЕ СЛОВА: критические акушерские состояния, материнская смертность, цифровая медицина, ВИМИС «АКиНЕО»

INTRODUCTION

Maternal near-miss events (MNM) are diseases, syndromes and symptoms that require resuscitation and intensive care interventions for women during pregnancy and for 42 days postpartum. The COVID-19 pandemic required non-standard solutions in monitoring the condition of obstetric patients with life-threatening conditions. In February 2021, the nationwide maternal near-miss Register (MNM Register) was created on the basis of the vertically integrated medical information system for the profiles of medical care “obstetrics and gynecology” and “neonatology” (hereinafter — VIMIS “AKiNEO” System). The MNM Registry allows receiving information about all patients with MNM from specialists of obstetric remote consultation centers of the subjects of the Russian Federation (hereinafter referred to as ORCCs) in a 24-hour mode [1]. Monitoring is carried out by leading specialists in obstetrics and gynecology, as well as anesthesiology and resuscitation (for pregnant women) of the Federal State Budget Institution “V.I. Kulakov National Medical Center of Obstetrics and Gynecology” of the Ministry of Health of Russia (hereinafter referred to as the NMC OG). According to Regulations for MNM Monitoring (hereinafter referred to as the Regulations), employees of ORCC should send information concerning MNM to VIMIS “AKiNEO” System within 24 hours from the moment a medical organization have sent a medical record about the case [2]. The staff of NMC OG (a separate service has been created) gets acquainted with MNM data in a round-the-clock mode and, if necessary, corrects the current therapy by means of telemedicine consultations (hereinafter — TMC).

The MNM Register makes it possible to record information about 192 case attributes (patient’s passport data, diagnosis, clinical and laboratory examination data, etc.), 60 attributes must be filled in (the obligatory nature is embedded in the format control of the System). The analytical block of the MNM Register allows to obtain aggregated information on patients with life-threatening conditions in the profile “obstetrics” in various sections — 48 widgets and analytical panels characterizing cases of critical obstetric conditions in the Russian Federation are implemented. A report builder of the MNM analytical block allows to make analytical reports on cases with any combination of their attributes [3].

AIM

The aim of the research is to analyze MNM cases in the Russian Federation from 2021 to 2023 by total number of cases, average number of cases monitored per day, and case characteristics. It is also important to identify changes in implementing stages of the System (2021) during the peak of the COVID-19 pandemic (2021–2022) and post-pandemic (2023).

MATERIALS AND METHODS

Overall number of cases and average number of cases monitored per day were obtained from relevant widgets of a MNM Registry analytical unit. The frequency of MNM cases was calculated using the formula: number of MNM (data from the analytical block of the MNM Registry) / number of births (data from the statistical reporting form No. 32 "Information on localization of obstetric and perinatal care in maternity hospitals (departments) and perinatal centers") × 1000.

Case characterization data for 2021, 2022, and 2023 were obtained by combining the following attributes in the MNM Registry report builder: leading MNM criterion, principal diagnosis according to the International Classification of Diseases 10th Revision (hereafter referred to as ICD-10), mean case duration, administration of artificial ventilation (hereafter referred to as ventilatory support), administration of extracorporeal membrane oxygenation (hereafter referred to as ECMO), obstetric status at the beginning and end of a case, a medical organization level of the beginning and end of the case, and administration of online remote consultations.

RESULTS

In total, 24,144 cases of critical obstetric conditions were entered into the MNM Registry from 2021 to 2023. The total and average number and frequency of MNM cases in 2021–2023 are summarized in Table 1.

Table 1

Obstetric "near-miss" cases in Russia 2021–2023

Таблица 1

Случаи критических акушерских состояний в Российской Федерации в 2021–2023 годах

Показатель / Indicator	Год		
	2021	2022	2023
Общее количество случаев критических акушерских состояний (КАС) (абс.) / Total number of obstetric "near-miss" cases (abs.)	8249	7580	8315
Среднее количество случаев КАС, находящихся на мониторинге в сутки (абс.) / Average number of obstetric "near-miss" cases monitored per day (abs.)	144	79	96
Частота случаев КАС (на 1000 родов) / Frequency of obstetric "near-miss" cases (per 1000 deliveries)	6,1	6,0	6,8

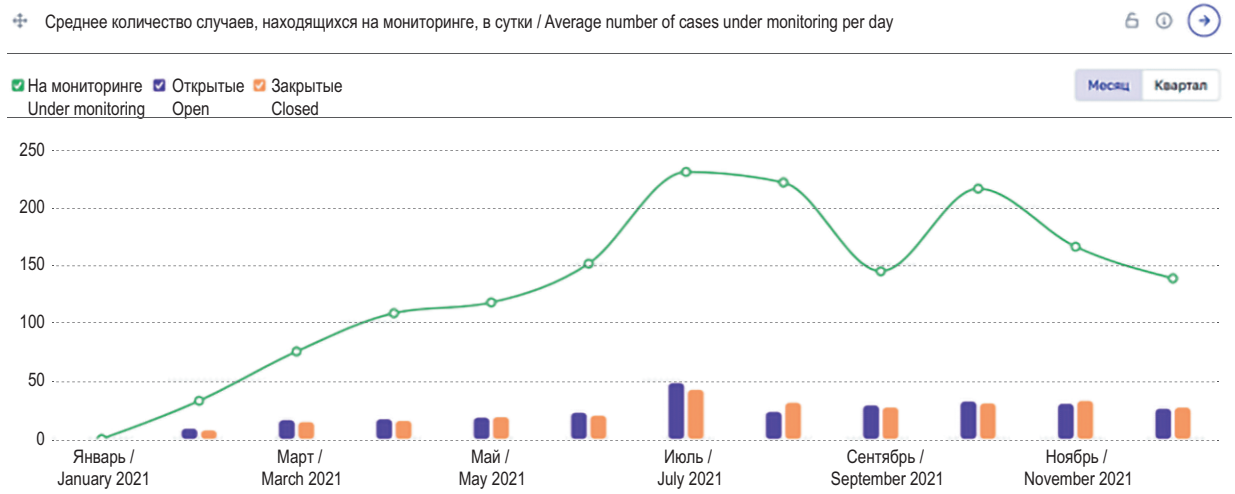

Fig. 1. Average number of obstetric "near-miss" cases monitored per day in 2021

Рис. 1. Среднее количество случаев критических акушерский состояний, находящихся на мониторинге, в сутки в 2021 году

In February 2021 (the MNM Registry was established), on average, 32 MNM cases were monitored per day. On July 2021, an exponential growth occurred and amounted to 230 MNM cases per day, which was the highest value for the entire period of MNM Registry's operation (Fig. 1).

This growth was caused by the "adjustment" of regional obstetric remote centers to work with the MNM Registry and the spread of a highly pathogenic strain of SARS-CoV-2 delta virus in the Russian Federation. According to results of the MNM Registry operation during the first year (2021), the incidence of SARS in the Russian Federation has almost reached the predicted incidence (7.5 per 1,000 births) which had been obtained when a concept for the Registry was accepted [4].

Table 2

Obstetric "near-miss" characteristic in 2021–2023*

Таблица 2

Характеристика случаев критических акушерских состояний в 2021–2023 годах*

Показатель / Indicator	Год		
	2021	2022	2023
Ведущий критерий критических акушерских состояний (КАС) / Leading criteria of obstetric "near-miss" case	• Тяжелая преэклампсия/ Severe preeclampsia — 2362 (28,6%). • Кровопотеря более 1000 мл и/или продолжающееся кровотечение / Blood loss of more than 1000 ml and/or ongoing bleeding — 1893 (23%). • Одышка более 25 в мин / Shortness of breath more than 25 per minute — 597 (7,2%). • Декомпенсированная соматическая патология, не классифицированная в других рубриках / Decompensated pathology, not classified in other categories — 588 (7,1%). • Острый респираторный дистресс-синдром / Acute respiratory distress syndrome — 367 (4,5%). • Другое / Other — 2442 (29,6%)	• Тяжелая преэклампсия / Severe preeclampsia — 2875 (37,9%). • Кровопотеря более 1000 мл и/или продолжающееся кровотечение / Blood loss of more than 1000 ml and/or ongoing bleeding — 2444 (32,2%). • Декомпенсированная соматическая патология, не классифицированная в других рубриках / Decompensated pathology, not classified in other categories — 324 (4,3%). • Гистерэктомия (любые показания) / Hysterectomy (any indication) — 195 (2,6%). • Госпитализация в отделение анестезиологии-реаниматологии (любые показания) / ICU admission (any indications) — 189 (2,5%). • Другое / Other — 1553 (20,5%)	• Тяжелая преэклампсия / Severe preeclampsia — 3551 (42,7%). • Кровопотеря более 1000 мл и/или продолжающееся кровотечение / Blood loss of more than 1000 ml and/or ongoing bleeding — 2495 (30,1%). • Декомпенсированная соматическая патология, не классифицированная в других рубриках / Decompensated pathology, not classified in other categories — 342 (4,1%). • Гистерэктомия (любые показания) / Hysterectomy (any indication) — 299 (3,6%). • Госпитализация в отделение анестезиологии-реаниматологии (любые показания) / ICU admission (any indications) — 169 (2,0%). • Другое / Other — 1459 (17,5%)
Диагнозы по МКБ-10 / Diagnosis (ICD-10)	• O10–O16 — 2914 (28,5%). • O30–O48 — 2252 (22,1%). • U00–U049 — 1878 (18,4%). • O94–O99 — 727 (7,1%). • O80–O84 — 391 (3,8%). • Другое / Other — 2050 (20,1%). • Всего / Total — 10 212	• O10–O16 — 3463 (36,3%). • O30–O48 — 2726 (28,5%). • O94–O99 — 705 (7,3%). • O80–O84 — 459 (4,8%). • U00–U049 — 302 (3,1%). • Другое / Other — 1898 (20,0%). • Всего / Total — 9553	• O10–O16 — 4102 (36,6%). • O30–O48 — 3272 (29,2%). • O94–O99 — 1148 (10,2%). • O60–O75 — 650 (5,8%). • O20–O29 — 611 (5,5%). • Другое / Other — 14 235 (12,7%). • Всего / Total — 11 208
Средняя длительность случая (дней) / Average duration of the case (days)	7	4	4
ИВЛ / Artificial ventilator	1277 (15,5%)	846 (11,2%)	736 (8,8%)

Ending of the table 2 / Окончание табл. 2

Показатель / Indicator	Год		
	2021	2022	2023
Проведение ЭКМО / Conducting ECMO	82 (1,0%)	17 (0,2%)	4 (0,0%)
Акушерский статус в начале случая / Obstetric status at the beginning of the case	• Родильница / New mother — 5821 (70,6%). • Беременная / Pregnant — 2064 (25,0%). • Аборт / Abortion — 180 (2,2%). • Внематочная беременность / Ectopic pregnancy — 95 (1,2%). • Роженица / Woman in childbirth — 89 (1,0%)	• Родильница / New mother — 5946 (78,4%) • Беременная / Pregnant — 1291 (17%). • Аборт / Abortion — 141 (1,9%). • Внематочная беременность / Ectopic pregnancy — 126 (1,7%). • Роженица / Woman in childbirth — 76 (1,0%)	• Родильница / New mother — 6853 (82,4%). • Беременная / Pregnant — 1135 (13,7%). • Аборт / Abortion — 156 (1,9%). • Внематочная беременность / Ectopic pregnancy — 101 (1,2%). • Роженица / Woman in childbirth — 70 (0,8%)
Уровень МО начала случая КАС / Hospital level in the beginning of the MNM case	• I уровень / I level — 269 (3,2%). • II уровень / II level — 1209 (14,7%). • III уровень / III level — 6661 (80,7%). • Вне МО / Outside the hospital — 21 (0,3%). • Иное / Other — 89 (1,1%)	• I уровень / I level — 208 (2,7%). • II уровень / II level — 1119 (14,8%). • III уровень / III level — 6221 (82,1%). • Вне МО / Outside the hospital — 23 (0,3%). • Иное / Other — 9 (0,1%).	• I уровень / I level — 177 (2,1%). • II уровень / II level — 1200 (14,4%). • III уровень / III level — 6921 (83,3%). • Вне МО / Outside the hospital — 15 (0,2%). • Иное / Other —— 2 (0,0%).
Уровень МО окончания случая КАС / Hospital level in the end of the MNM case	• I уровень / I level — 206 (2,5%). • II уровень / II level —— 1052 (12,7%). • III уровень / III level — 6878 (83,4%). • Вне МО / Outside the hospital — 17 (0,2%). • Иное / Other — 96 (1,2%)	• I уровень / I level — 155 (2,0%). • II уровень / II level — 983 (13,0%). • III уровень / III level — 6415 (84,6%). • Вне МО / Outside the hospital — 21 (0,3%) • Иное / Other — 6 (0,1%)	• I уровень / I level — 122 (1,5%). • II уровень / II level — 1097 (13,1%). • III уровень / III level — 7080 (85,1%). • Вне МО / Outside the hospital — 15 (0,2%). • Иное / Other — 1 (0,0%)
Проведено телемедицинских консультаций (в случаях КАС) / Telemedicine consultations (in MNM cases)	• Выполнена в срок / Completed on time — 375 (4,5%) • Выполнена с опозданием / Completed late —— 332 (4,0%)	• Выполнена в срок / Completed on time — 693 (9,1%) • Выполнена с опозданием / Completed late — 158 (2,1%)	• Выполнена в срок / Completed on time — 1144 (13,8%) • Выполнена с опозданием / Completed late — 256 (3,1%)

* MNM Register data. / По данным Регистра КАС.

Note: ALV — artificial lung ventilation; MO — membrane oxygenation; ECMO — extracorporeal membrane oxygenation of blood.
Примечание: ИВЛ — искусственная вентиляция легких; МО — мембранная оксигенация; ЭКМО — экстракорпоральная мембранная оксигенация крови.

Only after SARS-CoV-2 Delta strain was replaced by Omicron (beginning of 2022), there was a 45% decrease in the average number of cases monitored per day. The number of cases registered per year, respectively, decreased by 8%, the frequency of cases remained practically unchanged. Such dynamics was caused by a decrease in the proportion of "extra severe" cases (on ventilator, with ECMO) and, consequently, by a decrease in the average duration of a case (Table 2).

Major changes relate to the end of the COVID-19 pandemic in 2023: the number of leading MNM criteria and diagnoses associated with COVID-19 decreased dramatically, in particular U07 in 2023 is out of the top 5 diagnoses in MNM. Preeclampsia-related MNM (diagnosis group O10–O16) and diagnoses related to fetal, amniotic cavity, and delivery difficulties (diagnosis group O30–O48) decreased, primarily due to bleeding for placenta ingrowth and placenta previa.

Changes in the distribution of patients by obstetric status (increase in the proportion of obstetric causes) are associated with changes in MNM causes — a decrease in the proportion of COVID-19 and an increase in the proportion of obstetric causes.

CONCLUSION

As MNM Registry had been introduced, it triggered an improvement of routing obstetric patients: over 3 years, there have been trends in the reduction of the absolute number and proportion of MNM cases in level I medical organizations, growth at level III, and a stable number at level II. Ensuring transparency of routing at the level of ORCC (subject of the Russian Federation) and at the level of the specialized NMC OG (Russian Federation) made it possible to adjust the routing of patients with MNM according to the Procedure for the provision of medical care in the profile of "obstetrics and gynecology" throughout the country [5]. There was a significant decrease in the number of medical organizations with unspecified level of medical care (group "other") in the federal register of medical and pharmaceutical organizations of the Unified State Information System in the sphere of health care (hereinafter — FRMO). This change is associated with the absence of a medical organization level when reviewing MNM cases when using MNM Registry both by NMC OG and by specialists of a constituent entity of the Russian Federation.

The number of patients with MNM consulted by specialists of NMC OG through telemedicine consultations increased from 8.5% in 2021 to 16.9% in 2023 (data from the MNM Registry). Such dynamics is associated both with an overall increase in the number of TMCs conducted, and an improvement in recording consultations in the System. At the same time, the incidence of late withdrawal for TMC has sharply decreased from 47.1% in 2021 to 18.3% in 2023. Thus far, there is a reserve for improving MNM outcomes by timely reaching out for TMC with specialists at NMC OG.

FINDINGS

Introduction of the MNM Registry into large-scale functioning was rapid — 5 months after the start, peak values of an average daily number of monitored cases were recorded. When the waves of SARS-CoV-2 delta variant virus strain finished, and a number of cases decreased, the frequency of cases over 3 years did not decrease, on the contrary, a slight increase was observed. The COVID-19 pandemic had a strong impact on MNM characteristics. Once the pandemic ended, the "classical" obstetric causes of MNM returned to the top 3 (pre-eclampsia, hemorrhage, decompensated somatic pathology), the proportion of extragenital pathology decreased significantly, and the number and proportion of the most "severe" and difficult-to-survive cases of MNM decreased. The Registry's operation was a trigger both for improving the routing of obstetric cases (the number of cases in level I MOs has significantly decreased), and for improving the quality of management in system-related registry such as the FRMO. The MNM Registry continues to provide direct assistance to health care professionals in preserving the life and health of pregnant women and mothers.

The introduction of MNM Registry has led to a multiplicative effect on developing the obstetric and gynecological service in terms of MNM supervision in constituent entities of the Russian Federation. The Ministry of Health of the Russian Federation and the National Medical Center of Obstetrics and Gynecology have strengthened control over provision and development of ORCCs and telemedicine technologies, improved interaction between obstetric and multidisciplinary hospitals, as well as enhanced the digital health circuit of the country.

ADDITIONAL INFORMATION

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HEALTH OF CHILDREN 0–3 YEARS OF A LARGE INDUSTRIAL CITY

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ABSTRACT. The state of health is formed under the influence of many environmental factors. The first three years of life in the incidence of children about 20 % are genetic factors, and the main share (80 %) are environmental factors. Among the latter, atmospheric air pollution has a priority, especially in the regions where petrochemical enterprises are located. The composition of industrial emissions from such enterprises contains substances that have an adverse effect on the nervous, respiratory, immune and other systems of the body. Purpose of the study to identify prior diseases that determine the health status of children 0–3 years old in a city with a petrochemical industry, and propose measures to reduce and prevent them. The analysis of primary digital data of medical institutions in the city of Salavat on the number of registered diseases in children 0–3 years old was performed, the prevalence of diseases in children aged 1 month, 1 year, 2–3 years old and all children up to 3 years old inclusive, by disease classes was determined, their structure is studied, the ranks and main diseases that form the state of health of children in different periods of early childhood are determined. A comparative analysis of the incidence of children of the 1st year of life and children born 500 and more grams was carried out for 2011–2020 in the city of Salavat with indicators of the republican population of children of the corresponding age. The main source of atmospheric air pollution in the city of Salavat is emissions from the petrochemical complex "Gazprom Neftekhim Salavat". For 1000 children from 0 to 3 years old in 2020, 2292.0 ± 35.6 cases of diseases were registered, 82.1 ± 1.2 % of which are respiratory diseases. High, relative to the population level, levels of general morbidity of children with infectious diseases and respiratory organs are probably due to the influence of substances that pollute the atmospheric air of the city. In order to prevent and reduce the incidence of children' diseases, an important role is played by the reduction of emissions of chemicals into the atmospheric air, proper care and attention from parents, and high-quality professional medical care.

KEYWORDS: city with petrochemical production, outdoor air pollution, health of children 0–3 years old, leading forms of the disease, prevention

ЗДОРОВЬЕ ДЕТЕЙ 0–3 ЛЕТ КРУПНОГО ПРОМЫШЛЕННОГО ГОРОДА

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РЕЗЮМЕ. Состояние здоровья формируется под влиянием многих факторов среды обитания. Первые три года жизни в заболеваемость детей около 20% вносят генетические факторы, а основную долю (80%) составляют факторы окружающей среды. Среди последних приоритетное значение имеет загрязнение атмосферного воздуха, особенно в регионах расположения предприятий нефтехимической промышленности. В составе промышленных выбросов таких предприятий присутствуют вещества, обладающие неблагоприятным воздействием на нервную, дыхательную, иммунную и другие системы организма. Цель исследования — выделить приоритетные заболевания, определяющие состояние здоровья детей 0–3 лет в городе с нефтехимической промышленностью, и предложить меры по их снижению и профилактике. Выполнен анализ первичных цифровых данных медицинских учреждений г. Салавата о числе зарегистрированных заболеваний у детей 0–3 лет, определена распространенность заболеваний детей в возрасте 1 месяца, 1 года, 2–3 лет и всех детей до 3 лет включительно по классам заболеваний, изучена их структура, определены ранги и основные заболевания, формирующие состояние здоровья детей в различные периоды раннего детства. Проведен сравнительный анализ заболеваемости детей первого года жизни и детей, родившихся с массой тела 500 г и более, за 2011–2020 годы в г. Салавате с показателями республиканской популяции детей соответствующего возраста. Главным источником загрязнения атмосферного воздуха г. Салавата являются выбросы нефтехимического комплекса «Газпром нефтехим Салават». На 1000 детей от 0 до 3 лет в 2020 году зарегистрировано 2292,0 ± 35,6 заболевания, 82,1 ± 1,2 % которых представлены болезнями органов дыхания. Высокие относительно популяции уровни общей заболеваемости детей болезнями инфекционными, органов дыхания, вероятно, обусловлены влиянием веществ, загрязняющих атмосферный воздух города. В профилактике и снижении заболеваемости детей важную роль играет снижение выбросов химических веществ в атмосферный воздух, уход и внимание со стороны родителей, качественная высокопрофессиональная медицинская помощь.

КЛЮЧЕВЫЕ СЛОВА: город с нефтехимическим производством, загрязнение атмосферного воздуха, здоровье детей 0–3 лет, ведущие формы заболеваний, профилактика

INTRODUCTION

Children's health is formed under the influence of many environmental factors. A number of authors [1–10] believe that children's health is related by 25–40% to socio-hygienic living conditions, 25% to anthropogenic environmental pollution, up to 27% to the intra-school environment, and 25% to the activity and quality of medical care. Genetic factors contribute to about 20% of children's morbidity in the first three years of life, and environmental factors account for the major share (80%) [11]. Among the latter, atmospheric air pollution has priority importance, especially in the regions where petrochemical enterprises are located [12–14]. Such enterprises are a source of atmospheric air emissions, which include aromatic hydrocarbons, benz(a)pyrene, formaldehyde, ethylbenzene, 1,3-butadiene, chromium (VI), lead, nickel, cadmium, sulfur and nitrogen dioxides, nitrogen and carbon oxides, hydrogen sulfide, limiting and unsaturated hydrocarbons, phenols and other substances with allergenic, neurologic, immunological, carcinogenic, and generally toxic effects on the body [7, 12, 14–17]. The aerogenic load per inhabitant in cities with petrochemical and chemical enterprises ranges from 83.5 to 135 kg per year, which leads to increased health risks for the population, especially for children. Children born and living near petrochemical enterprises have higher rates of central nervous, respiratory, endocrine, digestive system, oncological pathology and congenital developmental pathologies [5, 8, 10, 11, 13, 14, 18, 19]. Health indicators of 0–3 years old children can serve as an indicator of the health status of the population in such cities.

AIM

The aim of the research is to identify priority diseases that determine the health status of 0–3-year-old children in a city with petrochemical industry and to propose measures to reduce and prevent them.

MATERIALS AND METHODS

There have been analyzed primary digital data from medical institutions in Salavat on the number of registered diseases in children aged 0–3 years. The research determined the prevalence of diseases in children aged 1 month, 1 year, 2–3 years and all children up to 3 years including by classes of diseases. The structure of these diseases has been studied, ranks and diseases influencing children's health in different periods of early childhood have been determined. A comparative analysis of morbidity in infants of the first year of life and children with birth weight of 500 g and more was performed for 2011–2020 in Salavat. The data were compared with indicators of the district population of the corresponding age. Statistical analysis was performed by means of StatiStica 6.0. Intensive and relative morbidity rates and probable confidence limits of disease prevalence were determined. The Pearson's pair correlation coefficient (χ^2) was calculated to identify the relationship between diseases of children of the first year of life and the content of toxicants in the atmospheric air.

RESULTS AND DISCUSSION

The city of Salavat is a large industrial city of the Republic of Bashkortostan, originally built as a socially favorable city, with a developed modern infrastructure and a high level of medical care for the population. The city is home to 23,628 children from 0 to 14 years old. Most of them were probably born in the families of petrochemical enterprise workers.

The city-forming enterprise of Salavat is LLC "Gazprom Neftekhim Salavat", which is the main source of atmospheric air pollution. According to the State Report "On the state of natural resources and the environment in the Republic of Bashkortostan" in 2020 the volume of emissions in the city amounted to 38.49 thousand tons, which is 4.19 thousand tons more than in 2019. There are 0.342 tons of emissions per inhabitant, 5.009 tons of emissions per 1 hectare of urban area. Ethylbenzene, nitrogen dioxide, formaldehyde, benz(a)pyrene, suspended particles prevail in the composition of the complex of air pollutants. Average annual concentrations for hydrogen sulfide — 0.002 mg/m^3, ethylbenzene — 0.015 mg/m^3, xylene — 0.045 mg/m^3, toluene — 0.084 mg/m^3, chlorobenzene — 0.03 mg/m^3, isopropylbenzene — 0.001 mg/m^3. Sulfur dioxide, carbon monoxide, nitrogen oxide are present in the atmospheric air. Maximum values of single concentrations reached for ethylbenzene 9.5 maximum permissible concentrations (MPC), isopropylbenzene — 2.8 MPC, chlorobenzene — 2 MPC, hydrogen sulfide — 1.0 MPC.

There are 4703 children aged 0–3 years living in the city. They accounted for a fifth (19.9%) of the total child (0–14 years) population of the city. In 2020, there were 2292.0±35.6 diseases per 1000 children of this age (Table 1). The probability of incidence (CI) with 95% confidence ranges from 2222.3 to 2361.7 cases per 1000 children of 0–3 years of age. The most frequent diseases are respiratory diseases — 1883.6±25.0‰, which made up the absolute (82.1±1.2%) majority of all diseases. The next most frequent diseases are digestive diseases — 82.0±5.5‰ with a specific weight of 3.5% and infectious diseases — 34.0±0.7‰, occupying 1.5% among other diseases.

The highest incidence rate in children occurred in the first year of life — 4546.0±141.4‰, with a probability of spread in the confidence interval (CI) from 4259.5 to 4692.0‰. At one month of age, 3326.3±28.5 diseases are registered per 1000 children, the main part (84.7±19.5%) of which are individual conditions occurring in the perinatal period — 2821.0±65.3‰. Among them, about half (47.0%) are infant cerebral disorders. At this age, every fifth child (200.0±32.4‰) has a respiratory disease, every tenth child is diagnosed with congenital developmental pathology (115.7±21.0‰) and diseases of the nervous system (94.7±2.4‰). The first year of life turns out to be a critical period when a child falls ill 4–5 times during the year, including 3 or 4 times due to respiratory diseases. Respiratory diseases become leading diseases (85.2±1.0%) during this period, the prevalence of which reaches 3765.9±40.7‰. Some conditions of the perinatal period continue to be diagnosed (5.0±0.3%) — 222.4±17.5‰. Diseases of the musculoskeletal system (104.5±9.6‰), digestive (87.1±9.0‰), nervous (44.8±7.0‰) systems, ear and mastoid (37.3±5.0‰), infectious (34.5±5.7‰) and other diseases begin to be registered.

The incidence rate decreases to 1585.0±16.5‰ among children of the second and third years of life. The range of probable prevalence of

Table 1

Morbidity in children aged 0–3 years in Salavat in 2023 (per 1000 children of the corresponding age)

Таблица 1

Заболеваемость детей 0–3 лет в г. Салавате в 2023 году (на 1000 детей соответствующего возраста)

Болезни / Diseases	**Все дети 0–3 лет / All children 0–3 years old n=4703**	**До 1 месяца / Up to 1 month n=95**	**До 1 года / Up to 1 year n=1205**	**От 1 до 3 лет / 1 to 3 years n=3403**
Всего / Total	2292,0±35,6	3326,3±28,5	4546,0±141,4	1585,0±16,5
Инфекционные / Infectious	34,0±0,7	–	34,5±5,7	29,6±2,6
Новообразования / Neoplasms	11,5±1,4	–	19,9±9,1	8,8±1,6
Крови, кроветворных органов, нарушение иммунных механизмов / Blood, hematopoietic organs, immune mechanisms impairments	8,0±1,3	21,0±9,2	13,2±10,4	5,8±1,2
Эндокринной системы / Endocrine system	4,0±0,2	–	4,8±4,8	4,1±1,2
Нервной системы / Nervous system	20,0±6,6	94,7±2,4	44,8±7,0	21,7±2,2
Глаза и его придаточного аппарата / The eye and its adnex	20,1±6,6	10,0±12,4	36,8±5,6	15,5±2,0
Уха и сосцевидного отростка / Ear and mastoid process	31,2±0,8	–	37,3±5,6	29,9±2,9
Системы кровообращения / Circulatory systems	–	–	–	–
Органов дыхания / Respiratory organs	1883,6±25,0	200,0±32,4	3765,9±40,7	1268,8±8,8
Органов пищеварения / Digestive organs	82,0±5,5	31,5±12,8	87,1±9,0	82,5±4,7
Кожи и подкожной клетчатки / Skin and subcutaneous tissue	12,9±4,4	31,8±12,8	34,9±5,7	10,8±1,7
Костно-мышечной системы / Musculoskeletal system	70,6±6,6	–	104,5±9,6	60,5±4,0
Мочеполовой системы / Genitourinary system	19,5±0,6	–	23,2±4,6	20,3±2,4
Отдельные состояния перинатального периода / Certain conditions of the perinatal period	57,0±7,0	2821,6±65,3	222,4±17,5	–
Врожденные пороки развития / Congenital malformations	9,8±1,5	115,7±21,0	15,8±3,6	7,9±1,6
Травмы, отравления, воздействие внешних причин / Injuries, poisoning, exposure to external causes	21,0±6,6	–	29,0±4,8	18,8±2,0
Кроме того: COVID-19 / Also: COVID-19	12,1±1,4	–	16,8±3,5	10,8±1,7

Примечание: – заболевания не выявлены.
Note: – diseases have not been identified.

diseases at this age becomes 1552.7–1617.3 cases per 1000 children ($p < 0.05$). Respiratory diseases are significantly ($p < 0.001$) 3 (2.9) fewer in this period of life compared to one-year-old children, although they remain the main ones (1268.8±8.8‰), occupying 80.0% of the total morbidity. Diseases of the gastrointestinal tract (82.5±4.7‰) with a share of 5.2% and musculoskeletal system (60.5±4.0‰) with a share of 3.8% follow in frequency.

As a child reaches 3 years, the share of various diseases and their importance in the formation of

health status changes. Respiratory, digestive and musculoskeletal diseases are the most common concerning their influence on morbidity levels in children aged 0–3 years. They account for 88.6–90% of all pathology in this age period (Table 2).

It should be noted that morbidity indicators have a close functional relationship with the growth factor. Thus, a strong inverse (negative) correlation (χ^2) is established for blood diseases (χ^2 — 0.97), some conditions of the perinatal period, mainly disorders of the central nervous system (χ^2 — 0.89), the connection of medium degree — for infectious diseases (χ^2 — 0.56), nervous system (χ^2 — 0.37), respiratory organs (χ^2 — 0.35). An important indicator of early child health is the incidence of congenital malformations (CMF). There are 9.8±1.5 (95% CI 7.0–11.8) cases of CMF per 1000 children 0–3 years of age, accounting for 0.42% of the total incidence. They are most detected in the first month of life, 115.7±21.0‰ (95% CI 74.8–156.6), accounting for 3.5±1.0%. During 1 year of age, their level decreases to 15.8±3.0‰ (95% CI 10.0–21.6) ($p < 0.05$), at 3 years of age to 7.9±1.6‰ (95% CI 4.8–11.0) ($p < 0.05$), accounting for 0.3% and 0.5%, respectively. The correlation between CMF and age dynamics is close and inverse (r –0.79).

A special attention should be paid to traumas and poisonings, as their occurrence depends exclusively on the attention of parents. There are 21.0±6.6 cases per 1000 children 0–3 years old, especially in the first year of life (29.0±4.8‰), which requires special attention from parents.

In 2020, a pandemic of COVID-19 new coronavirus infection (CI) emerged. Children were also affected, with 12.0±1.4 (95% CI 9.3–14.7) cases per 1000 children aged 0–3 years. No cases were diagnosed at one month of age, but during the first year of life one in 59 children was already sick — 16.8 ± 3.5‰ (95% CI 10.0–13.6) ($p < 0.05$), and at 2–3 years of age — 10.8±1.7‰ (95% CI 7.5–14.1) ($p < 0.05$).

Children's health in the first year of life is especially important for assessing ecological conditions of the population's health. According to the statistical document "Health of the population and activities of medical organizations in the Republic of Bashkortostan" it appears that the morbidity of children of the first year of life in Salavat in 2011 and 2015 was decreasing and was less than the republican indicators. However, in 2020 there was a rather significant increase in its incidence: the number of diseases (4546.5‰) has increased 2.3 times compared to the previous period (1934.3‰),

Table 2

The share of the most common diseases in different periods of life from 0 to 3 years of a child's life and their ranking positions (%)

Таблица 2

Удельный вес наиболее распространенных заболеваний в различные периоды жизни от 0 до 3 лет жизни ребенка и их ранговые места (%)

Ранги / Ranks	**Все дети / All children**	**До 1 месяца / Up to 1 month**	**До 1 года / Up to 1 year**	**2–3 года / 2–3 years**
1	Органы дыхания / Respiratory system 82,1 ± 1,2	Перинатальный период / Perinatal period 84,7 ± 19,5	Органы дыхания / Respiratory system 85,2 ± 1,0	Органы дыхания / Respiratory system 80,0 ± 1,2
2	Органы пищеварения / Digestive organs 3,5 ± 0,07	Органы дыхания / Respiratory system 6,0 ± 0,5	Костно-мышечная система / Musculoskeletal system 2,3 ± 0,08	Органы пищеварения / Digestive organs 5,2 ± 0,8
3	Костно-мышечная система / Musculoskeletal system 3,0 ± 0,07	Врожденные пороки развития / Congenital malformations 3,5 ± 0,02	Органы пищеварения / Digestive organs 1,9 ± 0,08	Костно-мышечная система / Musculoskeletal system 3,8 ± 0,6
4	Перинатальный период / Perinatal period 2,4 ± 0,06	Нервной системы / Nervous system 2,8 ± 0,04	Перинатальный период / Perinatal period 1,8 ± 0,08	Болезни уха и сосцевидного отростка / Ear and mastoid process 1,8 ± 0,6
5	Инфекционные заболевания / Infectious diseases 1,3 ± 0,08	Органы пищеварения / Digestive organs 0,9 ± 0,02	Нервной системы / Nervous system 4,0 ± 0,03	Инфекционные заболевания / Infectious diseases 1,8 ± 0,6

exceeding 1.5 times the republican indicator (2897.7‰) (Table 3). The general upward trend in morbidity can be explained by the COVID-19 pandemic in the republic. However, high levels of respiratory diseases in Salavat may be a consequence of a lower immunologic status of children due to the environmental situation in the industrial city and low level of preventive work.

Weak resistance of children in whole city might be proved by higher levels of morbidity compared to the population for all years of observation (2011–2020), as well as by higher incidence rates of infectious diseases. Children born with a body weight 500 g and more fall ill 1.9 times more often than the general population, showing a tendency to increase (Table 4).

It is noteworthy that in Salavat city blood diseases and separate disorders involving the immune mechanism are registered 10 (9.8–10.8) times less frequently than in the child population for all years of comparison. It is only one extremely low indicator among all cities and districts of the Republic. In our opinion, this situation can be explained only by insufficient diagnostics of such pathology.

Thus, there is a significant pollution of atmospheric air by a complex of toxic chemical substances with neuro-, immuno- and general toxic effect since Salavat has a large petrochemical enterprise. Since LLC "Gazprom neftekhim Salavat" is a city-forming enterprise, it employs a significant part of the population, who are likely to be parents of the majority of children. The city has a comfortable modern infrastructure, the population has a fairly high social, economic and medical support. Each child from 0 to 3 years old gets sick more than 2 (2.2) times during the year. This frequency corresponds to children aged 0–14 years (2.3 times, 2321.3‰), who are influenced by all environmental factors, including in-school factors. Moreover, children get sick 1.2 times more than adults in the city (1886.2‰). Some of them are also in contact with industrial factors. The high morbidity rate of young children in relation to other age categories of the population can be largely explained by low immunity. The immune system is negatively affected by atmospheric air pollution and emissions from the city's petrochemical enterprise, as

Table 3

The incidence of children diseases in the first year of life in the city of Salavat (per 1000 children of this age)

Таблица 3

Заболеваемость детей первого года жизни в г. Салавате (на 1000 детей данного возраста)

Заболевания / Diseases	**г. Салават / Salavat**			**Республика Башкортостан / Republic of Bashkortostan**		
	2011год / 2011 year	**2015 год / 2015 year**	**2020 год / 2020 year**	**2011 год / 2011 year**	**2015 год / 2015 year**	**2020 год / 2020 year**
Всего / Total	2121,9	1934,3	4546,5	2316,8	2194,1	2897,7
Инфекционные / Infectious	39,4	45,9	34,5	46,0	38,5	32,4
Крови и нарушения иммунитета / Blood and immune disorders	16,1	12,5	13,2	145,2	126,6	141,2
Органов дыхания / Respiratory system	1023,6	921,8	2359,8	1190,4	1232,1	1497,5
Перинатального периода / Perinatal period	532,5	520,3	222,4	503,1	465,8	539,8
Врожденные пороки развития / Congenital malformations	33,4	21,4	15,8	21,8	21,4	41,7

Table 4

Morbidity rate of children born with a body weight of 500 grams or more (per 1000 children of a given age)

Таблица 4

Заболеваемость детей, родившихся с массой тела 500 г и более (на 1000 детей данного возраста)

Годы / Years	**г. Салават / Salavat**	**Республика Башкортостан / Republic of Bashkortostan**
2011	473,0	342,2
2015	458,5	298,8
2020	547,3	285,2

well as by parents' health, since live in the same polluted city and, possibly, work at the petrochemical plant.

Infants of the first year of life suffer the most. During this period children are sick 4–5 times a year, including 3–4 times with respiratory diseases, which are leading in all ages, occupying 80–85.2% of the total morbidity. Digestive diseases (3.5–5.2%), diseases of musculoskeletal (2.3–3.8%) and nervous (0.8–2.8%) systems also make a certain contribution to the level of morbidity. Industrial emissions of petrochemical enterprise polluting the atmospheric air can contribute to the emergence of these forms of health disorders by their toxic-biological actions. This is confirmed by researches of other authors [20, 21]. Functional disorders of the digestive organs, musculoskeletal system, injuries require parents' attention to the quality of nutrition and child care.

There were 12 cases of COVID-19 per 1000 children 0–3 years old in children of Salavat city. The incidence of COVID-19 at the age of one year reached 16.8‰.

Infants' health plays a crucial role in assessing environmental conditions which influence public health. According to indicators from the official report of the Ministry of Health of the Republic, morbidity among children in Salavat city has a 2.3 times higher tendency to increase in comparison with the population. There is a particularly large difference in respiratory diseases, which is probably caused by the quality of atmospheric air and low immunity of children.

In our opinion, the extremely low rates of blood system pathology and certain conditions of the perinatal period involving the immune mechanism in children of the city with a high level of atmospheric air pollution require the focused attention of physicians and scientists.

CONCLUSION

Respiratory diseases constitute principal diseases that shape the health of children aged 0–3 years old in Salavat. Diseases of digestion, musculoskeletal and nervous systems, which are especially frequent in the first year of life, make their contribution as well. High levels of general infectious and respiratory morbidity of children of the first year of life are probably caused by substances polluting the atmospheric air of the city. In order to prevent and reduce child morbidity, it is essential to reduce emissions of chemical substances. Care and attention from parents, as well as high-quality, highly professional medical care, including prevention, diagnosis and treatment of children are also crucial for preventing and reducing child morbidity.

ADDITIONAL INFORMATION

Participation of the authors: the concept and design of the study — Karamova L.M., collection and processing of material — Karamova L.M., Vlasova N.V., writing the text — Karamova L.M., compilation of the list of literature — Vlasova N.V., editing — Karamova L.M., Gainullina M.K.

All authors are responsible for the integrity of all parts of the manuscript and approval of the manuscript final version.

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PROSPECTS FOR THE DEVELOPMENT OF INPATIENT PALLIATIVE CARE IN SAINT PETERSBURG

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ABSTRACT. ***Background.*** The increase in citizens' life expectancy and the ability ensuring proper support for incurable patients are not only achievements of the domestic healthcare system, but also a serious challenge that requires further development of palliative medical care in the Russian Federation. ***The aim*** of this study is to determine the need and prospects for the development of palliative medical care in a hospital setting, using the example of St. Petersburg. ***Materials and methods***. A content analysis of the documents regulating the provision of palliative care in St. Petersburg was carried out. ***Results.*** The Territorial program of state guarantees of free provision of medical care to citizens in St. Petersburg for 2023 and for the planning period of 2024 and 2025 provides for the financing of palliative medical care in a hospital in the amount of 0.092 bed-days per 1 resident per year. Thus, in 2023, it is planned to finance 495020.72 bed-days of palliative care in a hospital, for which at least 1,356 beds are needed. In 2022, 787 round-the-clock beds were functioning in the city to provide medical palliative care. The shortage of beds amounted to about 569 units, or 42 %, which determines the potential amount of the budget reserve for financing the corresponding assistance of about 547 428,35 thousand rubles for 2023. ***Conclusions.*** 1. In St. Petersburg, there exists an unmet demand for round-the-clock provision of palliative medical care, necessitating the establishment of additional facilities catering to this specific profile. 2. It is expedient to organize palliative medical care beds in urban hospitals, which will reduce the deficit while reducing the load on beds of another profile, optimize the continuity between different stages of palliative care provision, and actualize the real volumes of palliative medical care provided in urban hospitals.

KEYWORDS: palliative care, financing, need, shortage of beds, palliative interventions

ПЕРСПЕКТИВЫ РАЗВИТИЯ СТАЦИОНАРНОЙ ПАЛЛИАТИВНОЙ МЕДИЦИНСКОЙ ПОМОЩИ В САНКТ-ПЕТЕРБУРГЕ

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РЕЗЮМЕ. ***Введение.*** Увеличение продолжительности жизни граждан и возможность обеспечения должной поддержки неизлечимых больных являются не только достижением отечественной системы здравоохранения, но и серьезным вызовом, требующим дальнейшего развития паллиативной медицинской помощи в Российской Федерации. ***Цель работы*** — определить потребность и перспективы развития паллиативной медицинской помощи в условиях стационара на примере г. Санкт-Петербурга. ***Материалы и методы.*** Проведен контент-анализ документов, регламентирующих оказание паллиативной помощи в г. Санкт-Петербурге. ***Результаты.*** В Территориальной программе государственных гарантий бесплатного оказания гражданам медицинской помощи в Санкт-Петербурге на 2023 год и на плановый период 2024 и 2025 годов заложено финансирование паллиативной медицинской помощи в условиях стационара в объеме 0,092 койко-дня на 1 жителя в год. Таким образом, в 2023 году запланировано финансирование 495 020,72 койко-дней паллиативной медицинской помощи в условиях стационара, для чего необходимо не менее 1356 коек. В 2022 году в городе функционировало 787 коек круглосуточного пребывания для оказания медицинской паллиативной помощи. Дефицит коек составил около 569 штук, или 42%, что определяет потенциальный резерв бюджета для финансирования соответствующей помощи около 547 428,35 тысяч рублей на 2023 год. ***Выводы.*** 1. В Санкт-Петербурге существует неудовлетворенная потребность в койках круглосуточного оказания паллиативной медицинской помощи, которая диктует необходимость организации дополнительных учреждений соответствующего профиля. 2. Целесообразна организация коек паллиативной медицинской помощи в городских стационарах, что позволит сократить дефицит при уменьшении нагрузки на койки другого профиля, оптимизировать преемственность между различными этапами оказания паллиативной помощи и актуализировать реальные объемы оказания паллиативной медицинской помощи в городских стационарах.

КЛЮЧЕВЫЕ СЛОВА: паллиативная медицинская помощь, финансирование, потребность, дефицит коек, паллиативные вмешательства

INTRODUCTION

Increased life expectancy of citizens and possibility to provide proper support to terminally ill patients are not only an achievement of the national health care system, but also a serious challenge that requires further development of palliative care in the Russian Federation.

As predicted by Petrostat, by 2026 the proportion of people over 65 years of age will account for up to 18.9% of the total population of St. Petersburg, while the number of citizens who have lost the ability to work due to age will account for up to 28.2% [1].

The expediency of providing palliative care in hospitals is dictated by inability to provide full-fledged palliative care at home, the need to select adequate symptomatic therapy, training in general care or use of special equipment, prevention of psychological disorders in relatives of patients. Therefore, the availability of beds for palliative care is a criterion of its quality [2, 3].

Another acute problem is how to organize palliative interventions in terminally ill patients. Application of artificial nutrient fistulas and drainage operations often require hospitalization in a hospital where specialized surgical care is provided. At the same time, there are still problems of patient routing and continuity of various stages of medical care [4–7].

AIM

The aim of the research is to determine current needs and prospects for the development of palliative care in inpatient settings, using St. Petersburg as an example.

MATERIALS AND METHODS

The authors conducted a content analysis of organizational and administrative documents regulating the provision of palliative care in St. Petersburg.

RESULTS

According to the Decree of the Government of the Russian Federation No. 2497 “On the Program of state guarantees of free medical care

for citizens for 2023 and for the planning period of 2024 and 2025 years" issued on December 29, 2022, the need for palliative care in inpatient settings is determined at the rate of 0.092 bed-days per year per 1 resident [8].

According to the Law of St. Petersburg No. 737-121 "On the Territorial program of state guarantees of free medical care for citizens in St. Petersburg for 2023 and for the planning period of 2024 and 2025 years" issued on December 14, 2022, palliative care is financed from the budget of St. Petersburg. At the expense of budgetary allocations, it is planned to finance palliative care in hospital conditions in the amount of 0.092 bed-days per 1 inhabitant per year based on the projected number of city residents of 5,380,660 people in 2023. In 2023 the cost of one bed-day was 2764,70 rubles and 1 368 570,87 thousand rubles were allocated for 2023 [9]. Taking into account the estimated number of city residents in 2023 it was planned to finance 495,020.72 bed-days of palliative care in inpatient settings, which requires 1356 inpatient beds for palliative care without taking into account bed idle time.

According to the Order of the Government of St. Petersburg No. 31-rp "On approval of the St. Petersburg program 'Development of the system of palliative care' for 2019–2024 years" issued on August 28, 2019, 725 palliative care beds were deployed in 2019 in 18 health care institutions managed by the Committee on Health Care and administrations of the districts of St. Petersburg [10].

In 2022 there were 787 24-hour beds for medical palliative care according to the report on implementation of the state program "Health Care Development in St. Petersburg" [11]. Thus, the deficit of beds for round-the-clock provision of palliative medical care amounted to about 569 units, or 42%. This determines the potential budget reserve for financing of the relevant assistance amounting to about 547,428.35 thousand rubles for 2023.

Demand for additional 596 beds of round-the-clock palliative care dictates the need to organize new facilities for palliative care. For example, in Krasnoselsky district of St. Petersburg there is no hospice with 24-hour beds. The population of the district amounted to 431,546 people by January 1, 2023 [12]. Thus, there is a need for 104 beds to provide round-the-clock palliative care.

The amount of funding for inpatient palliative care which is included in the budget of St. Petersburg allows opening palliative care beds in the city's multidisciplinary hospitals. This will significantly reduce the workload of expensive specialized inpatient beds with palliative patients and reduce the loss of funding in case of over-fulfillment of the economic plan for the provision of specialized types of medical care.

The presence of specialized surgical and palliative beds in one institution will optimize the continuity between different stages of palliative care for patients in need of surgical interventions.

In addition, the allocation of palliative care beds will make it possible to actualize the real volumes of palliative care provided. The share of cancer patients in the structure of emergency hospitalization in surgical departments of the city hospital reaches 10.5%. At the same time 55–60% of them need surgery, and postoperative lethality reaches 30–40% [13]. The organization of palliative care beds will make it possible to analyze the performance of hospitals taking into account the expected high mortality in this group of patients.

CONCLUSIONS

There is an unmet need for 24-hour palliative care beds in St. Petersburg, which necessitates the organization of additional institutions for palliative care.

An alternative solution may be the organization of palliative care beds in urban hospitals. This measure will allow to reduce the deficit while minimizing the load on beds of other profiles, as well as optimize the continuity between different stages of palliative care and actualize real volumes of palliative care in city hospitals.

ADDITIONAL INFORMATION

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

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ASSESSMENT OF THE ADAPTABILITY OF A MEDICAL ORGANIZATION IS AN INDICATOR OF THE ORGANIZATIONAL EFFECTIVENESS OF PROJECT MANAGEMENT IN THE FIELD OF HEALTHCARE

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ABSTRACT. The period of forced adaptation caused by the COVID-19 pandemic indicates the need to accomplish the achieved results in order to realize the national development goals of the Russian Federation, defined until 2030. An analysis of emerging trends leads to secure these gains and find tools that will help make healthcare system available and improve the quality of medical services provided to patients. Adapting to modern challenges as a concept is used in many areas and branches of human activity as well as in healthcare to be successful in realization of national projects. At the same time, it is necessary to note the important interdependence between the ability to adaptability and the indicator of organizational effectiveness of project management of a medical organization, which are key elements of the functioning of a self-organizing system. The purpose of the research study was to analyze assessments of possible options for the adaptability of medical organizations (active and passive) implementing federal and regional projects in the field healthcare, in relation to the level of organizational maturity and sustainable development of the industry. For practical purposes, the use of adaptation assessments of medical organizations make it possible to determine the ability of the system to function stably and support possible changes in the outer environment. By correlating the results of assessments of the organization of project processes with the description of the effective experience model, a medical organization gets an idea of its pro and cons, determines major trends of its self-development, and therefore of its vital activity and on-going adaptability. Mentioned above indicates that achieving goals in compliance with the basic principles of strategic planning established by national projects in the healthcare industry depends on the ability of a medical organization to actively adapt to modern challenges in the internal and external framework of both — the project and competition. Accommodation and adaptation indicates flexibility and quick response, the presence of the necessary reserves in the healthcare system, and ultimately the adequate level of organizational maturity of project management of a medical organization.

KEYWORDS: adaptability of medical organizations, indicator of organizational maturity of project management, active and passive adaptation, interdependence of elements

ОЦЕНКА АДАПТИВНОСТИ МЕДИЦИНСКОЙ ОРГАНИЗАЦИИ — ПОКАЗАТЕЛЬ ОРГАНИЗАЦИОННОЙ ЗРЕЛОСТИ УПРАВЛЕНИЯ ПРОЕКТАМИ В СФЕРЕ ЗДРАВООХРАНЕНИЯ

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РЕЗЮМЕ. Период вынужденной адаптации, вызванный пандемией COVID-19, свидетельствует о необходимости продолжать следовать достигнутым показателям для реализации национальных целей развития Российской Федерации, определенных до 2030 года. Анализ проявившихся тенденций, возможно, позволит закрепить успехи и найти инструменты, которые помогут сделать отрасль здравоохранения доступной, повысят качество предоставляемых пациентам медицинских услуг. Адаптация к новым вызовам, с которыми приходится сталкиваться в современных условиях, и потребность находить новые, часто нестандартные, управленческие решения инициирует необходимость разработок новых инструментов реализации национальных проектов. При этом следует отметить важную взаимозависимость между способностью адаптивности и показателем организационной зрелости управления проектами медицинской организации, которые являются ключевыми элементами функционирования самоорганизующейся системы. Целью исследовательского вопроса стал анализ оценок возможных вариантов адаптивности медицинских организаций (активной и пассивной), реализующих федеральные и региональные проекты в сфере здравоохранения, во взаимосвязи с уровнем организационной зрелости и устойчивости развития отрасли. В практических целях применение оценок адаптации медицинских организаций позволит определить способность системы функционировать стабильно, поддерживать возможные изменения, адекватные внешней среде. Соотнося результаты оценок организации проектных процессов с описанием модели зрелости, медицинская организация получает представление о своих сильных, слабых сторонах, определяет приоритеты для саморазвития, а значит, готовность к текущей адаптивности. Изложенное свидетельствует, что достижение целей с соблюдением основных принципов стратегического планирования, установленных национальными проектами в отрасли здравоохранения, зависит от способности медицинской организации активно адаптироваться к новым требованиям в текущих условиях внешней и внутренней среды проекта, конкуренции. Приспособление и адаптация свидетельствуют о гибкости и быстрой реакции, о наличии необходимых резервов в системе здравоохранения, в конечном итоге об уровне организационной зрелости управления проектами медицинской организации.

КЛЮЧЕВЫЕ СЛОВА: адаптивность медицинских организаций, показатель организационной зрелости управления проектами, активная и пассивная адаптация, взаимозависимость элементов

INTRODUCTION

The main requirement for medical organizations that implement projects in the healthcare area is to maintain a vector focused on strategic goals and the ability to transform the system in case of changes in external and internal conditions that require an adequate response.

Adaptability of a medical organization is a kind of sign that characterizes project creativity in healthcare. "...It should be emphasized that the regional and municipal component of the priority National Project "Health Care" is not only a clear implementation of federal directives in the regions and municipalities, but also active creative work to supplement and expand them" [1].

This attribute is inextricably linked to the organizational maturity of project management of a medical institution. It characterizes the system elements in the relationship with the variables combined in loops of nonlinear feedbacks with the effect of delayed reaction. Assessing the degree of adaptive activity of medical organizations is an indicator of high management maturity of healthcare projects [2–5].

It is possible to assess the "digital maturity of the region" by the level of integration of the processes of digital transformation of the regional economic system in general and the healthcare industry in particular. Examples of digital maturity of medical organizations [6] can be the processes of implementation using omnichannel appointment to the doctor of a polyclinic. At the same time, the assessment of the completeness of digital maturity processes at the level of entities in the context of regional health authorities [7, 8] correlates with the level of adaptation of specialized software of the medical information system of the industry.

The analysis of the application of digital technologies at the regional level in the healthcare management system is presented in publications [7, 9], where the authors describe the effects in the form of optimization of cost planning mechanisms and efficiency of therapeutic and preventive decision-making obtained by using digital technologies.

Within the framework of the research question, on the one hand, an attempt is made to assess and interpret the manifestation of the unique properties of a medical organization as a self-organizing system subject to the current influence of environmental factors. On the other hand, it is stated that there is a collective memory of the results of the gained experience of project management in medical organizations, indicating the organizational immaturity of the management subject.

AIM

To make an analysis of assessments of possible variants of adaptability of medical organizations (the active and the passive), implementing federal and regional projects in the field of public health, in correlation with the level of organizational maturity and sustainable development of the industry.

MATERIALS AND METHODS

The base of the study was the publications of Russian and foreign scientists on the issues of studying the adaptive capacity of medical organizations to the changing conditions of the project environment. The analysis and evaluation were carried out in comparison with the levels of organizational maturity of project management. The number of literary sources used is 43, for the period from 2007 to the present. The information base of the study was federal and regional normative legal acts published in the reference and legal systems on the legislation of the Russian Federation "Garant". The databases of the Russian Science Citation Index (RSCI), Google Scholar search engine for full texts of scientific publications were used.

Research methods were: system-analytical, abstract-logical, content analysis.

RESULTS AND DISCUSSION

In recent years, there has been interest in using project management maturity models to assess the actual position of a medical organization compared to its potential capabilities [10, 11] and the achievements of other entities in specific aspects of management [12, 13].

Organizations, while managing projects, can adapt to changes, but they are not always capable of self-analysis and learning, because they do not have a choice, which is limited by the norms of sectoral federal and regional legislation [14, 15].

This circumstance prevents self-improvement of the organization, accumulation of the gained experience, thus hindering the processes of increasing the level of organizational maturity of project management [16, 17]. The lack of mechanisms of "self-adjustment" of the system, readiness to respond to various events in the changing environment do not allow to realize the goals [18].

At the same time, the means and tools of implementation can be defined and selected, but

since the medical organization is not subject to independent determination of goals, the results of project implementation are more of an answer than an adequate response. The lack of analytical work, conclusions, with the formation of collective memory on the results of the experience gained in project management indicates organizational immaturity and negative forecasts of the performance of indicative indicators defined by agreements and other industry directives of the project [19–21].

In turn, adaptation is a desirable property that allows to meet the seemingly contradictory needs of subjects implementing projects in the changing conditions of its external and internal environment. At the same time, in relation to social systems, to which the health care sector belongs, the ability to gradually adapt to changes in the environment can lead to failures in the implementation of projects by medical organizations if the conditions of this environment are worsening [14].

In order to find ways of adaptation, the use of Proposals (practical recommendations) of the Federal Service for Supervision of Health Care (Roszdravnadzor), aimed at creating a system of internal control and ensuring the quality and safety of medical activities by the criterion of organizing *the adaptation of employees* to the processes of care and provision of medical assistance to patients, is an important tool for assessing performance. The proposals concerned the system of employee management in a medical organization, namely compliance with the requirements designed to inform medical organizations about the main indicators that allow building a personnel management system that takes into account the professional potential of each employee, the most effective approaches *to the selection and adaptation of employees.* The organization of employee adaptation and induction involves the creation by the management of a medical organization of conditions under which the existing potential of employees is used most effectively to provide the population with high-quality and safe medical care [22].

At the same time, the key principles of adaptation assessment, including the operational core of a medical organization, are the patient orientation, process approach, risk management, continuous quality improvement, etc. [23–25, 43].

Taking into account that the region, municipal entity, medical organization are subordinated to the same goal, mission, strategy, tasks, management and organizational processes of the implemented project, the unity of structural elements, integrity, are inevitably subject to the principles of fractality and have an interdependent influence [26].

At the same time, it should be noted that executive authorities, health departments, create conditions for passive adaptation, which ultimately leads to the loss and insufficient optimization of resources by medical organizations (time, human and material capacities). Medical organizations, being the final executors of achieving project targets, are forced to adapt to the organizational management environment defined by the norms of current legislation [27, 28].

A passively adapting system functions to perform its functions in a given environment in the best possible way [29], i.e. maximizes its criterion of efficiency of functioning in a given environment. At the same time, the constant need for changes in all subjects of project activity involved in this process is not taken into account. It is not surprising that in such conditions the issue of ensuring strategic sustainability through the adaptation of public and corporate management to changed conditions is particularly acute [2, 16, 30, 31], whereas the systemic process of project implementation, regardless of the level, requires conscious and *active* adaptation rather than passive perception. This ultimately leads to an enrichment of collective understanding and cognition, which entails changes in the motivations, knowledge and judgments of health workers throughout the health system [32], despite its high degree of inertia and resistance to change.

An active adaptation is an iterative process that has sufficient agility to learn and adapt to possible changes in the environment. In the conditions of rapidly changing technologies, the ability to learn and adapt to innovations is of great value, and adaptation to changes at the individual level contributes even more to organizational and strategic flexibility [2, 33, 34].

It should be noted that the starting point for assessing the adaptability of a medical organization to the implemented project activities can be the process of backward planning, which allows to effectively focus on the implementation

of goal-oriented actions and reduce the risks of uncertainty [35, 36].

Being a somewhat paradoxical and counter-intuitive process, a "beginning with the end in mind", the technology of backward planning nevertheless provides an understanding of the structure to be followed both in defining project goals and in planning implementation tools, activities and unit processes. Strategies such as backward design [37] are closely related to the concept of project activity, as they can facilitate the formulation of unified strategic objectives, including in the healthcare industry [38, 39].

The assessment of the activity of adaptive capacity of a medical organization, which adapts to the project environment by improving the ways of interaction as it develops, will characterize the level of organizational maturity of project management (Table 1).

It is impossible not to notice such an inextricable interdependence between the degree of adaptability of a medical organization and the level of organizational maturity of project management [20, 39]. The correlation between the adaptability and organizational maturity of project management of a medical organization allows us to judge not only the level of *reactive* behavior of a medical organization, when the consequences of non-compliance can be eliminated when a negative situation arises, but also the launch of management mechanisms to actively search for the causes of the crisis. Appeared "...operational risks imply changes, first of all, in the work processes of the organization or team due to changes in the staff composition, reshuffles in the management, which will also have to adapt to..." [40].

Transformation of project management maturity models in a medical organization and implementation of evaluative strategies for adapting to a highly volatile world to form a new way of thinking is a necessary means of achieving project goals.

Adapting new models can be costly and intensive, but in strategic terms, the results of such adaptation lead to the possibility of survival of medical organizations and stabilization of the situation in the health care system.

A significant part of the initiated projects are completed beyond the time and budget constraints, failing to fully achieve the stated objectives, or are not completed at all. This is a clear evidence of the fact that, on the one hand, there is a gap between the development of project management theory and the practice of its application, and on the other hand, new areas of project management application require further development and improvement of adaptation methods with the assessment of organizational maturity of project management in medical organizations [41, 42].

As part of the development of organizational and strategic agility, medical organizations will need time to adapt to become organizations led by advanced leaders who know how to capitalize on the introduction of new approaches and technologies. A medical organization must be flexible enough to adapt to change, drive continuous increases in the volume and quality of health services, and be able to learn quickly and effectively.

To function in the current conditions of changing external environment and internal environment of the medical organization project is possible with the ability to continuously learn and adapt to changes in the direction of orderly complexity.

Characterization of model adaptability and levels of organizational maturity will determine the readiness to implement and develop a project management system with the intended goals, time and resource constraints.

Determination of adaptability versus organizational maturity of project management in a medical organization provides a well-thought-out and methodical mechanism of internal audit. It is a kind of detailed, objective and structured picture of the organization's summative competence that should be conducted on a regular basis.

The assessment of adaptability should be considered as the tendency of the medical organization to technological feasibility of the project processes, operational viability of the system, training, which are necessary elements to maintain a stable structure, indicating the level of organizational maturity.

In some cases, adaptability indicators have a direct or indirect impact on these trends, but together they form a whole and jointly realize the process of development and implementation of projects in health care system.

CONCLUSION

Adaptability of a medical organization implementing healthcare projects is, in the first

Table 1

Interdependence of adaptability and organizational maturity of project management of a medical organization

Таблица 1

Взаимозависимость адаптивности и организационной зрелости управления проектами медицинской организации

Показатель оценки/ Evaluation indicator	**Уровень организационной зрелости медицинской организации/ The level of organizational maturity of a medical organization**								
	Уровень 1 / Level 1			**Уровень 2 / Level 2**				**Уровень 3 / Level 3**	
Оценка адаптивности медицинской организации / Assessment of the adaptability of a medical organization	Применение отдельных практик успешных проектов, с незначительными зонами интереса у сотрудников к процессам управления проектами / Application of individual practices of successful projects, with insignificant areas of interest among employees in project management processes	Понимание высшим руководством необходимости и полезности методов проектного управления / Understanding by senior management of the need and usefulness of project management methods	Введение профессиональной, единой терминологии и частичная подготовка сотрудников / Introduction of a professional, unified terminology and partial staff training	Появление общей методологии управления проектами / Emergence of a common project management methodology	Формирование систематического плана по развитию персонала в области управления проектами / Formation of a systematic plan for the development of personnel in the field of project management	Наличие системы контроля по проектам, поддержка управления проектами на всех уровнях управления / Availability of a project control system, support for project management at all levels of management	Интеграция процессов управления проектами и качеством / Integration of project and quality management processes	Накопления процедур и интеграция лучших практик управления проектами. Создание проектного офиса или структуры / Accumulation of procedures and integration of best project management practices. Creation of a project office or structure	Формализация процессов управления проектами, поддержка деятельности на уровне корпоративной культуры / Formalization of project management processes, support of activities at the level of corporate culture
	–	–	–	–	–	–	+	+	+
	+	+	+	+/–	+/–	+/–	–	–	–

place, the ability to achieve performance indicators within the required limits within a certain period of time even if the impact of the project environment does not allow the current processes to be cost-effective. That is why the sustainability of a medical organization depends on its ability to actively adapt to the changing requirements of external and internal project influences. This is primarily ensured by flexibility and the possibility of reactive behavior, by realizing its potential (reserve). In case of failure to achieve the indicative indicators defined by agreements and other sectoral directives of the project, it will be necessary to revise, possibly, the system of elements of the organizational structure of the project and transform the process.

As a result of continuous monitoring of the actual results of the project's process activities against the initial expectations of stakeholders, the project team can receive information and, in accordance with it, integrate changes, actively adapt, and learn quickly and effectively.

At the same time, the effectiveness and reliability of a medical organization's work on a project should be viewed as a systemic phenomenon, and as it moves towards maturity and stability, new elements (processes) will be added to the project. It is likely that the iterativity, and therefore the dynamism of the project as a system with feedback and counterintuitive behavior, will help to realize its nature and change the approach to the process.

The assessment of adaptability of a medical organization directly indicates its ability to improve with experience, learning, as it has the capacity to choose the best performance, which certifies the level of organizational maturity.

Thus, the *reactivity* of the medical organization's behavior, which triggers management mechanisms to actively search for the causes of the crisis, is able to transform the opposition into mutual complementarity, contradictory needs into orderliness.

Such a process will require from medical organizations conscious and active adaptation, not passive perception. It is a long-term effort to create a collective assessment of the project by all project stakeholders that will probably involve changes in motivations, knowledge, and judgments throughout the health care industry.

ADDITIONAL INFORMATION

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

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SOCIAL INSURANCE FOR TEMPORARY DISABILITY: MAIN CHANGES AND OPPORTUNITIES FOR STUDYING INDICATORS

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ABSTRACT. The purpose of the work is to analyze the main changes in the social insurance system and the regulatory framework for examination of temporary disability in the period from the 30s of the 20th century to the first decades of the 21st century (until the creation of the Social Fund of Russia), give a description of the indicators used for characteristic of the term temporary disability (TD) and study their main changes. The content analysis of 42 regulatory documents, methodological materials for the examination of TD, accounting and reporting documentation, digests of statistical information of the regional and federal levels was used. The main changes in the management of the social insurance system concerning the event of TD, the financing of insurance payments, the functions of the sick leave, and some aspects of the examination of TD cases are considered. Based on normative documents, the reason for the transition from a set of indicators of morbidity with temporary disability, calculated in the Soviet period, to indicators characterizing the state of TD nowadays, is shown.

KEYWORDS: social insurance, temporary disability, indicators

СОЦИАЛЬНОЕ СТРАХОВАНИЕ ПРИ ВРЕМЕННОЙ НЕТРУДОСПОСОБНОСТИ: ОСНОВНЫЕ ИЗМЕНЕНИЯ И ВОЗМОЖНОСТИ ИЗУЧЕНИЯ ПОКАЗАТЕЛЕЙ

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РЕЗЮМЕ. Цель работы — проанализировать основные изменения в системе социального страхования и нормативной базы экспертизы временной нетрудоспособности в период с 30-х гг. XX в. — первых десятилетий XXI в. (до момента создания Социального фонда России), дать описание используемых показателей, характеризующих временную нетрудоспособность (ВН)

и изучить их основные изменения. Использован контент-анализ 42 нормативных документов, методических материалов по экспертизе ВН, учетно-отчетной документации, сборников статистической информации регионального и федерального уровней. Рассмотрены основные изменения в управлении системой социального страхования на случай ВН, финансирования страховых выплат, функций листка нетрудоспособности, некоторых аспектов экспертизы ВН. На основании нормативных документов показана причина перехода от комплекса показателей заболеваемости с временной утратой трудоспособности, рассчитываемых в советский период, к показателям, характеризующим состояние ВН в настоящее время.

КЛЮЧЕВЫЕ СЛОВА: социальное страхование, временная нетрудоспособность, показатели

INTRODUCTION

In population health statistics, indicators of temporary disability (TD), initially referred to as indicators of morbidity with temporary disability (MWTD), occupy a special place. For a long time, they have made it possible to study among working contingents the morbidity leading to TD. The opportunity to study MWTD indicators in our country appeared due to the creation and mutual interaction of the state health care system and social insurance system.

The formation of the social insurance system in Russia began in the early XX century, and from the emergence (1903–1917) passed four stages in its development. On June the 23rd of 1912 The State Duma approved the law on providing workers with two types of insurance: against illness and accidents [1]. One of the first legislative documents of the Soviet period were decrees on the introduction of state social security and insurance, including December the 22nd of 1917 Decree "Regulations on sickness insurance" was adopted [1]. Later, through the joint efforts of health care organizers, Soviet scientists, trade unions in our country was built a system of state social insurance, including TD. The global changes that followed in the 90s of the XX century in practically all spheres of life in Russia, due to the change in the state status of the country, led to a significant change in the system of social insurance (SSI), legislation in the implementation of this type of expertise, established in the Soviet period. And the widespread use of electronic methods of transmitting various information in the XXI century has led to changes in a number of management structures. A new stage in the functioning of the SSI began on January 1, 2023, when the Social Fund of Russia (SFR) was established in accordance with the Federal Law No. 236-FL dated 14.07.2022 [2] in order to optimize the structure, centralize the establishment of social payments, as well as to reduce existing costs.

One of the changes in the XXI century is the lack of completeness and uniformity of information characterizing TD at the federal and regional levels. Since 2001, the publication "Health Care in Russia" has been published with a frequency of once every two years, and since 2015 it has been published only in electronic form [3]. In the publication "Health Care in Russia — 2015". (presents information for 2012–2014) for the first time appeared the table "Causes of temporary disability", in which the data are shown only in absolute values. The Unified Interdepartmental Information and Statistical System (UIISS) presents official statistical indicators of the number of cases and the number of days of TD per 100 workers and the average duration of 1 case of TD (in days) in the Russian Federation and individual federal districts and regions for the period from 2005 to 2016, with no data on the causes of TD [4]. At the regional level, electronic versions of statistical compilations "The state of health care and public health in Smolensk region" have been published since 2001, including TD indicators [5]. At the same time, since 2007, instead of indicators of the number of cases and days of TD per 100 workers, the information about MWTD is given in absolute numbers. However, the absolute values of cases and days of TD carry important information for the analysis of social benefits, but do not allow us to fully analyze MWTD among the working population. The availability of a set of MWTD indicators has not lost its relevance over many decades. Taking into account reorganization transformations in many spheres of activity, socio-political and economic situation, digitalization, the question arises about the possibility of returning to relative values (intensive indicators) for the analysis of MWTD. The above-mentioned problem can be a subject of

discussion in the educational process of students in residency and advanced training programs.

AIM

To study the main changes in the system of social insurance and regulatory and legislative base of temporary disability expertise in the period from the 30s of the XX century to the first decades of the XXI century (until the creation of the SFR). To give a description of the used indicators characterizing TD.

MATERIALS AND METHODS

The study used the method of content-analysis of normative acts and methodological materials on the examination of temporary disability, accounting and reporting documentation at different stages of SSI activity. We analyzed 47 normative documents for the period 1931–2022, both those that have lost their force [6–28] and those that are in force [2, 29–41]. Sources of statistical information: data from the Federal State Statistics Service (Rosstat) [3], the Unified Interdepartmental Information and Statistical System (EMISS) [4], SOMIAC [5]. We studied the materials "Health Care in Russia" for the period from the beginning of their publication in 2001 up to and including 2023 [3], as well as statistical collections "State of Health Care and Population Health in Smolensk region" in printed format for the periods 1985–1988 and 1991–2008 and in electronic format for the period 2000–2022 [5, 42].

RESULTS

The management of state social insurance for a long time was carried out by trade unions, which in the 1930s made a significant contribution to the formation of a unified state SSI in the country. In accordance with the Soviet government decree of June 23, 1931 "On Social Insurance" the All-Union Central Council of Trade Unions together with the People's Commissariat of Labor of the USSR was entrusted within three months to develop a draft consolidated law on social insurance (the system of social insurance bodies, funds and budget of social insurance, tariffs of insurance premiums, provision of pensions) [10]. The supreme governing body in this system was the All-Union Central Council of Trade Unions, which submitted the social insurance budget for approval by the Government. At the level of each individual organization an active role in the social support of workers was played by trade union committees, called in that period as factory committees (FC) or local committees. In particular, in the 30's. production strikers with at least a year of work experience were granted the maximum TD benefit (in the amount of full earnings) from the first day of disability. The fact of striking was established by the FC together with the administration [10].

Financing of social insurance (SI) was provided mainly through the payment of insurance premiums by employers and citizens. The amount of SI contributions was set separately for each trade union and, depending on the industry, varied from 4.4% to 9% of the payroll [1]. The amount of paid benefits for TD depended on union membership and trade union seniority, as well as the duration of TD.

A special place in the system of social support of the working population in case of TD belongs to the "sick leave" (s/l), a document that since the 90s of the XX century has been referred to in the normative acts only as a "disability leave" (d/l) [27]. In August 1937, the All-Union Central Council of Trade Unions and the People's Commissariat for Health of the USSR approved Instruction No. 1382 "On the procedure for issuing sick leave certificates to the insured" [7]. The emergence of this document became the starting point for the appearance of the first sick leaves in the country. For several decades, the "sick list" became a multifunctional document: performing a legal function, certifying release from work for the period of TD and determining the established regime; a medical function, indicating the cause of TD; insurance. It is also a financial document on which TD benefits are calculated. But, in addition, initially and for a long time d/l was important as the main accounting document of statistics of morbidity indicators with TD.

The procedure for issuing and registration of the "sick leave", carried out in medical institutions, was carried out in accordance with the main legislative and instructional-methodological documents on the examination of temporary disability: instructions of the All-Union Central Council of Trade Unions and the People's Commissariat for Health of the USSR from 14.07.1937, No. 1382 [7], the Regulations on the Examination of Temporary Disability in Medical and Preventive Institutions from 20.08.1957 [8], the Decree of the Soviet Minister of the USSR from 26.07.1937 No. 530 [11], instructional and methodological letter of the Ministry of Health of the USSR dated 11.02.1974 [6], orders of the

Ministry of Health of the USSR dated 14.07.1975 No. 06–14/6 [9] and dated 10.11.1981 No. 1157 [16]. So, the action of the instruction of 1937 year on the territory of the Russian Federation was canceled only in 1994 year by the order of the Ministry of Health of the technical industry of the Russian Federation and the social insurance fund No. 206/21 from 19.10.1994 [17].

In the period from 1937 to 1994, doctors had the right to single-handedly issue sick leave each time for no more than 3 days, and in total for a given case of illness or injury for no more than 6 days. At the same time, the first normative document laid down the principle of collegiality in extending sick leave beyond the time limits set for the attending physician's sole issuance of sick leave. Thus, the instruction of 1937 stated: "Extension of sick leave beyond 6 days after the onset of incapacity for work and any subsequent extension is made by the attending physician only with the approval of the chief physician or the medical advisory commission (MAC), organized in the medical institution" [7]. The principle of collegiality was retained in the subsequent commissions for the examination of temporary incapacity for work — clinical-expert commissions (CEC), functioning from 1995 to 2008 [18], as well as medical commissions (MC) functioning since 2009 [23, 33].

In accordance with the regulatory framework of the Soviet period, the patient's age, sex, diagnosis, place of work, type and terms of TD were indicated in the forms. At enterprises, the information from the sick leave forms was entered into the record form "Personal Card of the Employee".

Each trade union organization submitted monthly reports to the regional and central committees of trade unions and the All-Union Central Council of Trade Unions, until the adoption in 1990 of the decree on the establishment of the Social Insurance Fund (SIF) of the RSFSR on January 1, 1991 [12, 13, 26]. Copies of the reports were provided to the health authorities. The unified system of accounting and reporting on disability covered all branches and collectives of organizations.

Based on the information contained in the s/l at any level of health care management, each branch of the national economy of the country as a whole and an individual organization had comprehensive data on all generally accepted indicators characterizing the state of TD: "Indicator of the number of MWTD per 100 workers", "Indicator of the number of days of MWTD per 100 workers", "Indicator of the average duration of 1 case of MWTD", "Indicators of the structure of MWTD". And at the enterprises these indicators were supplemented with the indicators of the multiplicity of TD cases per year per 1 worker, indicators of the number of sick and non-sick persons (health index). However, attention should be paid to the correctness of comparing the MWTD data of the Soviet and Russian periods. TD reports (No. Z-1, approved by the USSR Central Statistical Service of 26.03.1955, No. 17-36) included only working days. The report form itself singled out diseases that were widespread, while the rest of the diseases, amounting to about one third of the total number, were categorized as "other" [43].

The process called "perestroika" led to the formation of the Russian Federation in 1991 and to the formation of new management structures in the country. In this case, the change of governing bodies in the system of social insurance took place back in the USSR with the adoption of the Decree of the Council of Ministers of the RSFSR and the Federation of Independent Trade Unions of the RSFSR from 25.12.1990 No. 600 "On improving the management and the order of financing the costs of social insurance of workers of the RSFSR" and the creation of the RSFSR Social Insurance Fund from January 1, 1991 [12]. Further, already in the Russian period, for the realization of the state policy in social insurance issues fundamentally new management bodies are created — federal and regional branches of the Social Insurance Fund, the supreme management body becomes the Federal Social Insurance Fund of the Russian Federation (FSIF RF) [13, 14, 26]. Since 1994, the Social Insurance Fund of Russia and its territorial bodies constitute a single centralized system of management bodies of social insurance funds in case of TD and in connection with maternity. According to the Decree of the Government of Russia from 12.02.1994 No. 101 "Regulations on the Social Insurance Fund of the Russian Federation" FSIF becomes a specialized financial and credit institution under the Government of the country, managing the funds of the state SIF [14].

A further change occurs at the beginning of the XXI century, it is associated with the adoption of the Tax Code of Russia and concerns social insurance funds, which are formed at the expense of mandatory insurance contributions to the FSS for employers. In accordance with the current Tax Code of the Russian Federation (Part 2 of the Tax Code of the Russian Federation dated 05.08.2000, No. 117-FL), the value of the tariff of insurance contributions for compulsory social insurance in case of STI initially amounted to 5.4% of the labor remuneration fund

[29]. In subsequent editions of the federal law, the insurance contribution rate was reduced to 4.0% in 2001, and in 2006 — by another 1.1%. And up to the present time the social insurance tax on TD in connection with maternity is 2.9% [41].

The current Federal Law No. 169-FL of 01.07.2011 "On Compulsory Social Insurance for Temporary Inability to Work and in Connection with Maternity" requires the insurer (employer) to keep records and reports on the expenditure of funds for the payment of insurance benefits, including TD [39]. On the basis of l/n for which insurance payments were made, reports (calculations) are submitted quarterly to the territorial funds according to the form approved by the federal executive body, and the social insurance fund submits a report to the Government of the Russian Federation.

The adoption in 2006 of the law of 29.12.2006 No. 255-FL introduced a distinctive feature in the development of the social insurance system — financing of benefits for some types of TD for the first 2 days at the expense of the employer, and at the expense of the budget of the social insurance fund — for the rest of the period, starting from the third day [38]. And since 2011 at the expense of the insurer benefits are paid for the first three days of TD, at the expense of the budget of the social insurance fund — for the rest of the period, starting from the 4th day of TD (in the wording of 08.12.2010 No. 343-FL).

The controlling role of the social insurance authorities in relation to employers in the issues of spending financial resources and in relation to medical organizations in the issues of temporary disability examination is increasing.

In the social and economic conditions that changed in the 1990s, the order of control over the organization of the examination of temporary incapacity for work is changing. This procedure is approved by the joint order of the Ministry of Health and the Social Insurance Fund from 06.10.1998 No. 291/167 [19]. Since 1995, medical institutions have introduced the position of deputy chief physician for clinical and expert work (CEW) or the position of deputy chief physician for the examination of temporary incapacity for work, whose functional responsibilities include internal control over the organization and conduct of the examination of temporary incapacity for work [18, 20]. The results of regular control are recorded in a record document — "Journal of clinical and expert work of a medical and preventive institution" (form 035/u-02) [32]. This document, approved in 2002, replaced the record form 035/u "Journal for recording the conclusions of the medical advisory committee", used since 1980 [15].

The duties of the deputy chief physician for CEW also include control over the maintenance of medical records, statistical recording and reporting, and analysis of MWTD indicators (TD status).

In the period from 1995 to 2011, the terms of one-time and sole issuance of a sick list were significantly increased: by the attending physician it is given one-time up to 30 calendar days, and by the CEW it is fiven one-time up to 30 calendar days and for a total period of 10–12 months [17]. Since 2012, the terms of issuance of s/l by an attending physician and one-time issuance by a medical commission have been reduced to 15 calendar days [40]. At the same time, in deciding the issue of the terms of issuance of s/l are guided by the indicative terms of TD for the most common diseases and injuries, approved by the Ministry of Health and the Social Insurance Fund in 2000. [36]. These terms are of a recommendatory nature. The medical commission, when deciding on the issuance of s/l for periods exceeding the indicative terms, takes into account not only medical criteria of working capacity, but also social criteria.

The key regulatory document that led to a radical change in the indicators characterizing the state of TD is the Federal Law No. 5487-1 of 22.07.1993 "Fundamentals of Legislation of the Russian Federation on the Protection of Citizens' Health", in which one of the patient's rights is the observance of medical confidentiality [28]. Since 1995, the s/l has lost its function as a statistical document on the basis of which MWTD records were kept and reports were prepared. It should be noted that during the period of existence of the sick leave (certificate of incapacity for work) 3 types of printed forms and one electronic version were created. The first (1937–1994) and the second (1995–2006) forms contained the columns "Diagnosis" and "Final Diagnosis". In the "perestroika years", when using the old-type forms, these columns were no longer filled in. And since 2007 and in the subsequent forms of the 2011 form and the electronic version in 2020, in order to respect medical confidentiality and protect the patient's personal data, the boxes for recording the diagnosis are not provided [21, 24, 25, 35, 37]. Consequently, at the level of organizations, which submit s/l for payment to the accounting department, there is information on the number

of workers, the number of cases and days of TD, but there is no data on the diagnosis of diseases to calculate the generally accepted statistical indicators of TD status. Only the calculation of indicators by types of TD remains available.

In medical organizations, the main statistical document for recording the state of temporary disability is the "Ticket for a completed case of temporary disability" (form No. 025-9/u-96), introduced in health care practice since 1997 [31]. Based on the information contained in these coupons, the state statistical report of a medical and preventive institution (MPI) of the form No. 16-TD "Information on the causes of temporary disability" is formed. Medical information allows to keep records of types of temporary disability, diseases by nosological forms and gender of the patient. And to the regional level of health care system management from all medical institutions are submitted information on the absolute values of cases and days of incapacity for work by nosological forms of diseases in general and with a breakdown by sex. In connection with the accelerating transition in the Russian Federation to legally significant electronic document flow, including the active implementation of electronic medical records and medical information systems in the daily work of medical organizations, it becomes possible to generate various statistical reports, including the form 16-TD, in the form of electronic documents [30, 34]. At the same time, the content of this statistical form remains unchanged.

At the same time, on the one hand, information on the number of working men and women has been added to the statistics of TD indicators since 1997, which ensures the calculation of generally accepted indicators with sex distribution [42]. On the other hand, at the level of a particular medical institution, due to the lack of information on the number of working population, it is possible to calculate only the average duration of one case of ST in the structure of morbidity with temporary disability from the indicators.

An innovation since 2007 was the payment of benefits not only at the main place of work, which required changes in the statistics of TD accounting and reporting [22]. Health authorities at the regional level present TD statistics by absolute values of the number of cases and days of incapacity for work in the region per year instead of the previous intensive values. At the regional level, as well as at the level of an individual hospital, only the calculation of the average duration of one TD case and the calculation of the TD structure remain unchanged. In general, at the federal level of the country, due to the expansion of the private sector of the economy, the problem of obtaining information on the number of employees arises. Thus, by 2007, the previous practice of maintaining and studying TD statistics on the basis of unified state documentation, including in the health care sector itself, was lost.

It is possible that the introduction of electronic document flow, including electronic certificates of incapacity for work and electronic medical records, will make it possible to calculate TD indicators "number of cases" and "number of days" per 100 workers in certain sectors of economic activity. In particular, the calculation of these indicators in the health statistics of medical workers is possible due to the creation of the federal register of medical workers (FRMW) and organizations (FRMO).

CONCLUSION

Despite the cardinal change in the management of SSI at TD — the creation of federal and regional branches of the social insurance fund, the main directions of support for workers at TD occurrence, established in the Soviet period, are preserved. The development of the activities of the Russian social insurance fund, in accordance with the legislation, is aimed at improving the types and amounts of social payments, quality control Examination of temporary disability. The initially laid principle of collegiality in the examination of temporary incapacity for work is preserved and improved throughout the functioning of the social insurance system. The realization of one of the principles of health protection in the Russian Federation — the preservation of medical confidentiality — required legislative changes in the form s/l, accounting and reporting documentation on the examination of temporary disability. As a consequence, the statistical information, which in Soviet times allowed to calculate in full the indicators characterizing the state of TD, has changed. Digitalization of various spheres of economic activity, as well as methodological solution of the issue of taking into account s/l at the patient's place of work (both main and part-time) when calculating TD indicators will allow to expand sectoral statistics.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpre-

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PATIENT-REPORTED OUTCOME MEASURES: THE IMPLEMENTATION GUIDE

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ABSTRACT. The assessment of the quality of medical care in many countries includes the assessment of patient-reported outcome measures (PROMs). The article defines and differentiates the concept, provides classification of PROM-questionnaires and guidelines for use in routine clinical practice and for research purposes. Measuring patient-reported outcomes bears a number of advantages for patients and the healthcare system. Routine use of PROMs is an important element of personalized therapy, improves patients' adherence and satisfaction. The implementation of PROMs at the national level is a base of the examination of the quality of medical care and monitors the effectiveness of clinical teams. PROMs data can be used as a base of budget allocation, planning funding programs, for the study of how spending levels relate to the health outcomes of patients by exact region and healthcare provider. The choice of PROMs should be focused on relevant disease; be the latest version of a validated questionary; be convenient for the patient. The main problems of PROMs implementation include: lack of understanding of the role of PROMs in improving the quality of medical care and as one of the mechanisms for improving the efficiency of the healthcare system; lack of questionnaires with validated translation; lack of working mechanisms for linking PROMs results to medical care payments; low awareness of clinicians and patients; lack of time at routine clinical processes to PROMs implementation; lack of online services and platforms.

KEYWORDS: value-based healthcare, patient-oriented approach, patient adherence, quality of life, shared decision making, patient-reported outcomes, personalized medicine

ПАЦИЕНТСКИЕ ПОКАЗАТЕЛИ ИСХОДА: РУКОВОДСТВО ПО ВНЕДРЕНИЮ

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РЕЗЮМЕ. Оценка качества медицинской помощи во многих странах включает оценку пациентских показателей исхода — PROMs (patient-reported outcome measures). В статье дается

определение и дифференциация понятия PROMs, классификация опросников, рекомендации по применению в рутинной клинической практике и в исследовательских целях. Оценка пациентских исходов имеет ряд преимуществ как для пациентов, так и для системы здравоохранения. Рутинное использование PROMs является важным элементом персонализированной терапии, улучшает приверженность пациентов и их удовлетворенность проводимым лечением. Внедрение PROMs на национальном уровне позволяет использовать оценку для экспертизы качества медицинской помощи, отслеживать эффективность клинических бригад. Данные PROMs можно использовать при распределении бюджета, при планировании программ финансирования, для изучения того, как уровни расходов соотносятся с результатами здоровья пациентов в каждом регионе и медицинской организации. При выборе PROMs следует обращать внимание на следующее: опросник должен быть релевантным нозологии; необходимо использовать только валидизированные опросники последних версий; отдавать предпочтение наиболее простым и удобным для пациента; использовать только тогда, когда это действительно необходимо. К основным проблемам внедрения PROMs можно отнести такие, как отсутствие понимания роли PROMs в улучшении качества медицинской помощи и как одного из механизмов повышения эффективности системы здравоохранении; недостаток опросников, имеющих валидизированный перевод; отсутствие реально работающих механизмов привязки результатов PROMs к оплате медицинской помощи; низкая осведомленность врачей и пациентов; отсутствие времени у врача для внедрения PROMs; недостаток онлайн-сервисов и платформ.

КЛЮЧЕВЫЕ СЛОВА: ценностно-ориентированное здравоохранение, пациентоориентированность, приверженность пациента, качество жизни, совместное принятие решения о лечении, исходы, сообщаемые пациентами, персонализированная медицина

INTRODUCTION

Quality of medical care is a multifaceted concept that includes a set of characteristics reflecting “the timeliness of medical care, the correct choice of treatment methods, the degree of achievement of the planned result”. The definition of the quality of medical care is revised, clarified and supplemented over time [1]. At the same time, doctors and patients can evaluate the quality of medical care in different ways, including its impact on the quality of life of patients [2].

Assessment of the quality of medical care abroad includes, along with other indicators, assessment of the patient’s perspective — assessment of “patient outcome indicators” or “patient-reported outcomes” [3]. In many countries, the measurement of “patient-reported outcomes” for a number of nosologies is mandatory [3]. There are few studies devoted to the use of patient-reported outcome measures in the domestic literature. A number of publications review the most common indicators for a specific profile (the oncology) [4], or condition (e.g., in patients with stoma) [5]. Another study describes the role of patient-reported outcome measures as an element of real-world evidence (RWE) implementation [2].

AIM

To describe the existing practice of using patient-reported outcome measures (PROMs) and the possibilities of their implementation in Russian practice.

MATERIALS AND METHODS

The Russian and foreign literature devoted to the issues of organizing the implementation of patient-reported outcome measures was analyzed. The review did not include publications devoted to direct measurement of PROMs in various diseases and conditions. The main parameters and provisions were formulated based on the synthesis of information.

Definition and differentiation of concepts

Patient-reported outcome (PRO) is “an outcome of a health condition directly reported and experienced by the patient” [3]. Patient-reported outcome measures (PROMs) are a patient’s subjective assessment of his or her condition, formalized using standardized questionnaires [6], which allows physicians to reasonably adjust therapy based on the patient’s feelings. PROMs questionnaires allow physicians to assess the impact of the disease and

treatment on the patient's quality of life and psychological state. PROMs are used in studies comparing different treatment methods and help to choose the treatment method that best meets the individual needs of a particular patient, taking into account his or her perception of quality of life. Various scales can be used to measure PROMs: Likert, ordinal (rank), Crespi, Stapel, semantic differential.

PROMs should not be confused with indicators such as:

- PCOMs (patient-centered outcomes) — the use of a questionnaire covering issues and problems specific to a particular patient (questionnaire of attitude to a certain type of therapy);
- PREMs (patient-reported experience measures) — patient's experience of the treatment process and his/her stay in the medical organization, satisfaction with the quality of service provision.

Professional validated questionnaires are used to assess PROMs. PROMs are used in clinical trials to better understand the efficiency of treatment, but in routine clinical practice in Russia such questionnaires are not yet widespread.

History

The need to assess the quality of life in clinical practice was first established at the national level in Sweden in 1975. The idea of assessing the results of treatment by interviewing patients was first proposed by a group of specialists from Oxford, who used this concept to assess the success of surgery [7]. Since then, interest in this topic has steadily increased.

Currently, PROMs questionnaires are widely used in clinical practice in many countries. For example, in Great Britain, since 2009, the results of PROMs have been used universally when making global decisions in the country's healthcare [8], standards for outcome assessment have been published [9], and the results of PROMs for a number of the most significant diseases are being registered. Initially, the requirement for mandatory collection of PROMs data applied only to four surgical procedures: hernia removal, hip and knee joint replacement, and varicose veins. More recently, the validity of routine PROMs measurements has been demonstrated for a wide range of chronic diseases, including diabetes, asthma, stroke, chronic obstructive pulmonary disease (COPD), and others.

PROMs questionnaires are constantly being improved to be patient-friendly and informative for clinicians. Recently, a new generation of short and easy-to-use instruments for regular monitoring of patient outcomes has been proposed. For example, the SF-36 questionnaire has been modified and shortened to 12 items [10]. These instruments are quick, efficient and easy to understand, as they allow patients to rate their health status and experience in a semi-structured way and aggregate input data accordingly, automatically tracking physical-emotional sensitivity. ICHOM (International Consortium for Health Outcomes) has made a major contribution to the development of patient outcome assessment.

With the development of information technology, the assessment of "patient-reported outcomes" began to be realized through digital means, and the concept of electronic PROM questionnaires — ePROMs — emerged. Thus, within the framework of the NIH (National Institute of Healthcare) initiative, the Roadmap for Patient-Reported Outcomes Measurement Information System (PROMIS) was developed. With the launch of PROMIS, computerized testing of the general population became possible. PROMIS uses modern advances in psychometrics such as item response theory (IRT) and computerized adaptive testing (CAT) to create highly reliable and validated measurement tools [11].

Types of PROMs questionnaires

PROMs are divided into universal questionnaires, which assess general indicators of a patient's physical and psychological state, and specific questionnaires, which are designed for specific nosologies and conditions.

The most widely known universal questionnaires are the SF-36 and the EQ-5D. The SF-36 and its shortened version, the SF-12, assess physical and psychological health on 8 scales.

The EQ-5D assesses five basic indicators: mobility, self-care, ability to maintain usual daily activities, pain, and anxiety. The questionnaire is used to measure patient health status, provide evidence of cost-effectiveness, and population surveys to study population health. The main advantages of using the EQ-5D, unlike other general quality of life questionnaires, are that the final data represent a

single score of the respondent's health, and the questionnaire is universally used for both extended population surveys and specific patient populations.

The use of the EQ-5D and SF-36 as universal questionnaires has been justified for a wide range of health problems, as they are valid for a wide variety of diseases, have high reliability and good sensitivity.

However, in some diseases (e.g., cancer), the use of universal questionnaires may miss important elements of patient assessment. For such complex cases, condition-specific questionnaires are developed. PROMs specific questionnaires have been developed for patients with chronic diseases, for cancer patients, and for a number of other rare and severe diseases.

The use of PROMs in the routine clinical practice

The techniques of PROMs vary depending on the objectives. Symptom measures can focus on a range of conditions (universal PROMs) or on a specific pathology (specific PROMs), such as depression or pain. Functioning measures assess activities such as self-care, activities of daily living, and motor activities.

Questionnaires can be administered face-to-face in the clinic or remotely — via online platforms, email, or telephone.

Typically, PROMs are assessed before, during, and at the end of treatment. Each specific questionnaire contains recommendations for its use depending on the specifics of the disease or the patient's condition. Based on the results of the assessment at the beginning of therapy, the physician can decide on the choice of treatment method, and the results of the assessment measured during treatment allow to adjust therapy if necessary. PROMs assessment performed at the end of treatment is an additional indicator of treatment success.

Health-related Quality of Life (QoL) assessment tools are typically multidimensional questionnaires that assess a combination of aspects of impairment and/or disability and reflect a patient's health status. In contrast, QoL goes beyond impairment and disability to include questions about a patient's ability to meet their needs as well as their emotional response to their limitations.

When choosing one or another PROMs, attention should be paid to the following:

- the questionnaire should be relevant to the nosology (the clinical problem);
- only validated questionnaires and their validated translations should be used;
- when choosing a questionnaire, it is important to make sure that it is the latest version (questionnaires can be improved);
- if there are several current versions of the questionnaire relevant to the clinical problem, preference should be given to the one that is the simplest, shortest and most convenient for the patient;
- appropriateness of use — it is recommended to use questionnaires only when it is really necessary (when there is a complex clinical situation and when there is an objective need to include the patient in the assessment of his/her condition);
- keep in mind that every survey has its limits.

Recently, electronic versions of questionnaires — ePROMs — have been increasingly used. When using digital PROMs, the advantage should be given to cloud services and the possibility of integration with electronic medical records and medical information systems (MIS), as well as the protection of patient's personal data [12].

When introducing PROMs into routine clinical practice, it is necessary to revise the operational processes in the clinic, since filling out and analyzing questionnaires requires time-consuming work for medical personnel. In addition, it is necessary to educate the clinical team and patients, explaining to them the importance of completing questionnaires and their role in personalized therapy [13].

The use of PROMs in research

Studies involving PROMs need to be planned in advance, selecting clinical endpoints and outcomes. A well-developed study design involving PROMs allows physicians to track adverse events in real time, adjust treatment regimens, and monitor patients' condition.

Studies with PROMs should be conducted according to a strict plan (Table 1) with mandatory training of all involved specialists, as well as instructions for patients.

The use of PROMs at the national level to assess health system performance

The results of PROMs measurement can be used to assess the efficiency of the health care system as a whole, individual regions or specific medical organizations [14]. Based on the published information on PROMs measurement results, patients can assess which clinic demonstrates the best results of treatment of a particular disease and choose the one with higher success rates.

However, presenting PROMs data to the general public and patients in an unambiguous and understandable form is a difficult task. PROMs for individual nosologies, medical intervention (surgery) or hospital as a whole can be used as part of key performance indicators and ratings of medical organizations. Often, PROMs results are displayed as a funnel plot — a dot plot of the total PROMs results for each hospital based on the total number of surgeries performed. However, average PROMs vary more widely in hospitals that perform fewer surgeries than in those that perform more. The funnel plot shows provider performance measured in terms of EQ-5D postoperative questionnaire scores (Fig. 1).

PROMs data should serve as a benchmark and starting point for health care providers: to identify the reasons for their performance and to determine what is needed to improve quality. PROMs indicators can identify differences among patients in health-related quality of life, as well as differences in the performance of health care teams.

Benefits of the PROMs using

The use of patient-reported outcome estimates has a number of important advantages.

1. *Personalized treatment.* The use of PROMs questionnaires at different stages of treatment allows therapy to be tailored to the patient's condition, personal characteristics and lifestyle. Routine use of PROMs is an important element of personalized therapy and allows achieving better clinical results [16]. Patients are not only the source of PROMs data, but also key potential users of the information they generate. Patients planning to choose a clinic and physician can refer to PROMs data provided by other patients. This will allow them to make a choice in favor of one or another specialist, clinic, as well as to evaluate and predict possible treatment outcomes.

2. *Developing patient adherence.* Assessment of the patient's quality of life prior to treatment is the starting point of patient involvement in the decision-making process of therapy choice. Involving the patient in the process of treatment and choice of therapy improves adherence and therefore reduces healthcare costs in the long run by making the patient more responsible for his/her health.

3. *Patient satisfaction.* Focusing the patient's attention on symptoms and initial results of treatment not only allows to adjust the therapy if necessary, but also improves the patient's understanding of his/her disease and condition, his/her awareness of the reasons for adjusting the therapy, and therefore his/her satisfaction with the treatment process and the achieved results.

Table 1

The research plan using PROMs study

Таблица 1

План проведения исследования с включением PROMs

Этап / Stage	**Описание / Description**
Определение целей исследования / Research objectives	Что оцениваем? Какие опросники используем? / Research objectives? Questionary choice?
Формирование плана / Forming a plan	Кто координатор исследования? Какой дизайн исследования? Размер выборки? Статистическая мощность? Критерии включения и исключения? / Research coordinator? Research design? Sampling? Statistical power? Inclusion and exclusion criteria?
Критический анализ / Critical analysis	Трудоемкость и затраты? Практическая применимость в клинической ситуации? / Labor intensity and costs? Practical applicability in a clinical situation?
План внедрения / Implementation plan	Какой план внедрения? График внедрения? / Implementation plan? Implementation schedule?
Оценка / Evaluation	Достигнутые результаты и выводы? / Results and conclusion?

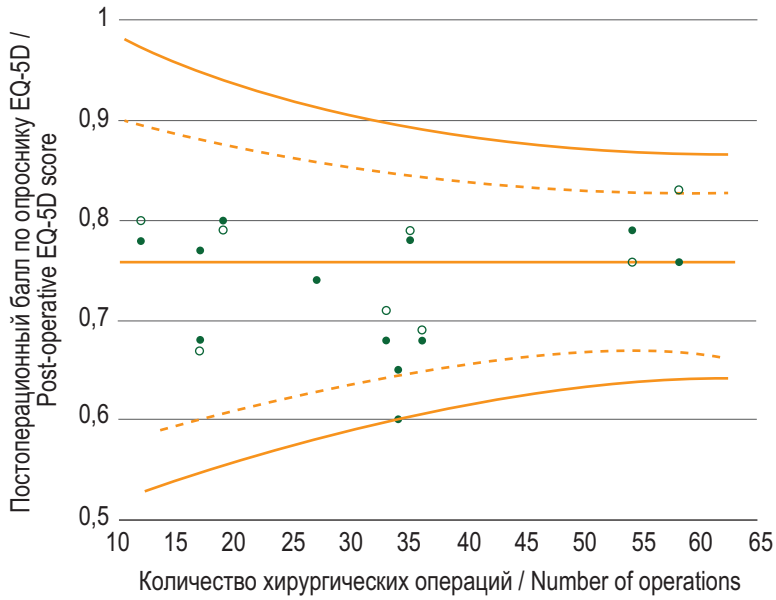

Fig. 1. Example of a funnel plot for the post-operative EQ-5D score Browne et al. [15]

Рис. 1. Пример графика воронки для отображения результатов операции с помощью шкалы опросника EQ-5D (по данным Browne et al.) [15]

4. *Expertise of the quality of medical care.* Implementing PROMs at the national level or as part of a disease-specific registry can help to monitor the effectiveness of clinical teams. Regular use of PROMs can also improve understanding of how a particular method works in a particular patient.

5. *Cost reduction and efficiency in utilization of the healthcare budget.* Accounting for PROM results is one of the elements of value-based healthcare. In countries where PROM monitoring has been introduced at the national level, payment for medical care is tied to the result — the "pay-for-performance" approach. Patients whose health has improved, according to the EQ-5D questionnaire, have the greatest increase in QALYs and, accordingly, the clinic receives greater reimbursement. PROMs data can be used in budget allocation, in planning financing programs, and to examine how spending levels relate to patient health outcomes in each region and health care organization.

Restrictions on the use of PROMs

Despite a number of advantages of using PROMs in routine clinical practice, there are a number of problems related to quality assessment and cost-effectiveness.

- It is impossible to be completely certain that a particular medical intervention has had an impact on a patient's quality of life [14]. Improvement and deterioration in quality of life may have been caused by other factors.
- The assessment of quality of life based on PROMs after medical intervention should be conducted within a strictly defined time frame so that changes in quality of life can be linked specifically to the medical intervention. For example, collecting PROMs data six months after hip surgery may not provide relevant results about the success of the surgery because it misses the point at which the patient first returned to normal life.
- Taking PROMs into account when assessing the cost-effectiveness of treatment often only considers the cost of the primary intervention (surgery), but may not take into account the costs of adjuvant therapies such as rehabilitation, pain medications, etc.
- The problem of objectively assessing PROMs is also related to the fact that we do not know what patients compare their condition to. The level of pain for the same condition may be perceived differently by different patients depending on their experience of pain.

Problems of PROMs implementation in Russia

Due to the lack of a unified regulatory framework for the routine assessment of patient outcome measures, their application in Russia is still difficult. Initiatives are needed both at the national level to establish uniform standards of work and quality assessment processes, and pilot projects at the level of individual medical organizations or clinical teams.

The main problems of PROMs implementation include the following:

- lack of a clear understanding of the role of PROMs in improving the quality of care and as one of the mechanisms for improving the effectiveness of treatment (and the health care system);
- lack of validated questionnaires for a number of nosologies (especially rare ones) and/or lack of validated translation;
- lack of really working mechanisms for linking PROMs results to payment;
- low awareness of physicians and patients;
- lack of physician time to implement PROMs;
- lack of online services and platforms that would contain the necessary questionnaires and that would integrate with medical information systems.

CONCLUSION

With the development of a patient-centered approach and personalized medicine, the need for the development of new specific PROMs will increase, which will require the creation of interdisciplinary working groups, multicenter and cross-country studies, and validation of translation.

Implementing the assessment of patient-reported outcome measures into routine clinical practice requires changes in clinic operational processes and the consolidation of the norm of mandatory quality of life assessment for certain nosologies. Physician and patient education is an important factor for the successful establishment of a PROMs data bank.

ADDITIONAL INFORMATION

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RISK FACTORS FOR SOCIALLY SIGNIFICANT INFECTIONS AMONG WORKING- AND OLDER WORKING-AGE POPULATION (ON THE TUBERCULOSIS EXAMPLE)

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ABSTRACT. The article presents the results of an ecologic study where leading risk factors for socially significant infections (SSI), on the tuberculosis (TB) example, among working-age (WA) and older working-age (OWA) population, which is especially actual at the period of implementation of the pension reform in Russia were determined. In the study face-to-face survey in 1,497 adults aged 18 y.o. and older in Republic of North Ossetia-Alania (RNO-Alania) was conducted; differences between variables assessed by Fisher's exact test. Based on the study results it was established that OWA group, compared to WA, is less healthy (1.7 times), more often has chronic diseases, including TB (2 times), ($p<0.0001$). Also, OWA people are more vulnerable in socio-economic terms: they prove to be more often single, especially women (1.4 times), more often disabled (1.6 times), earn less (1.4 times), medical care is less accessible to them (1. 3 times) ($p<0.001$). At the same time, OWA group is more conservative: being aware of the negative impact of close family ties in SSI, among them those who avoid contact with TB relatives are definitely fewer, especially women ($p<0.001$), less who approve use of telemedicine ($p<0.002$), and fewer who have smartphones ($p<0.0001$). WA group, earning more and being more progressive, compared to OWA, more often consumes alcohol (1.4 times) ($p<0.048$), more often associates poor health with poor nutrition (1.2 times) and environmental problems (1.5 times) ($p<0.001$). The obtained data allow us to conclude that in national programs of non-prolifiration of SSI, which reduce the quality of public health, at the period of realization of the pension reform in Russia, along with health problems in OWA population, it is necessary to take into account their socio-economic adaptation, conservatism and historical-cultural features. Behavioral, nutritional and environmental risk factors for SSI (TB), especially among WA, should also be reduced.

KEYWORDS: socially significant infections, tuberculosis, risk factors, working- and older-working-age groups, pension reform

ФАКТОРЫ РИСКА СОЦИАЛЬНО ЗНАЧИМЫХ ИНФЕКЦИЙ СРЕДИ НАСЕЛЕНИЯ ТРУДОСПОСОБНОГО И СТАРШЕГО ТРУДОСПОСОБНОГО ВОЗРАСТА (НА ПРИМЕРЕ ТУБЕРКУЛЕЗА)

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РЕЗЮМЕ. В статье представлены результаты экологического исследования по определению ведущих факторов риска социально значимых инфекционных заболеваний на примере туберкулеза среди населения трудоспособного возраста (ТВ) и старшего трудоспособного возраста (СТВ), что особо актуально в период пенсионной реформы в России. Проведен опрос 1497 взрослых от 18 лет и старше в Республике Северная Осетия-Алания. Различия переменных оценивались по точному критерию Фишера. По итогам исследования установлено: группа СТВ по отношению к группе ТВ менее здорова (в 1,7 раза), чаще имеет хронические заболевания, чаще болеет туберкулезом (в 2 раза) ($p < 0,0001$). Также люди СТВ более уязвимы в социально-экономическом отношении: чаще одиноки, особенно женщины (в 1,4 раза), чаще имеют инвалидность (в 1,6 раза), меньше зарабатывают (в 1,4 раза), медицинская помощь им менее доступна (в 1,3 раза) ($p < 0,001$). В то же время группа СТВ более консервативна: при осознании негативного влияния тесных родственных связей при социально значимых инфекционных заболеваниях (СЗИЗ), среди них меньше избегающих контакта с больными туберкулезом родственниками, особенно среди женщин ($p < 0,001$), меньше одобряющих применение телемедицины ($p < 0,002$), меньше имеющих смартфоны ($p < 0,0001$). Группа ТВ, больше зарабатывая и будучи более прогрессивными, по сравнению с группой СТВ, чаще употребляет алкоголь (в 1,4 раза) ($p < 0,048$), чаще связывает плохое здоровье с плохим питанием (в 1,2 раза) и проблемами экологии (в 1,5 раза) ($p < 0,001$). Полученные результаты позволяют заключить, что при разработке национальных программ по противодействию распространению СЗИЗ, снижающих качество общественного здоровья, в период реализации пенсионной реформы в России, наряду с проблемами здоровья у населения СТВ, необходимо учитывать вопросы их социально-экономической адаптации, консервативность и историко-культурные особенности жителей регионов. Следует также снижать поведенческие, нутритивные и экологические факторы риска распространения СЗИЗ (туберкулеза) среди населения, особенно среди ТВ.

КЛЮЧЕВЫЕ СЛОВА: социально значимые инфекции, туберкулез, факторы риска, трудоспособный возраст, старше трудоспособного возраста, пенсионная реформа

INTRODUCTION

Reducing the burden and impact on the quality of public health (PH) of socially significant infectious diseases (SSID), which include tuberculosis (TB), HIV infection, parenteral viral hepatitis and other diseases that pose a danger to others, is one of the global problems of society both in Russia and worldwide [1–3]. In Russia, despite the observed downward trend in TB rates as one of the most common SSID, this infection still remains an urgent and significant medical and social problem [4, 5]. SSID, including TB in people of working age (WA) and older working age (OWA), are a special problem.

From the point of view of medicine, old age comes when irreversible physiological changes begin in the human body. From the economic point of view the "old age" begins at retirement age. The World Health Organization refers to old age as people from 65 years of age and above [6]. In the Russian Federation, before the pension reform that began in 2019, the OWA population included men from the age of 60 and women from

the age of 55 [7]. The pension reform provides for a gradual increase in the retirement age among men and women; according to the latest version of the Federal Law of the Russian Federation No. 400-FL of 28.12.2013 (ed. of 25.12.2023, not in a force) "On Insurance Pensions", the retirement age for men is increased to 65 years, for women it is increased to 60 years, and the working age starts at 15 years [8]. Currently, Russia, as well as the rest of the world, is experiencing population aging: over 60 years, from 1961 to 2021, the number of WA population in the country increased by 19%, and the number of OWA persons by 167% [9]. A.A. Kalininskaya et al. note that by 2050, there will be about 74 OWA people per 100 WA people; at the same time, OWA people, despite high mortality and morbidity among them, have become more socially and physically active, which should be used as the country's economic potential [10].

Returning to SSID, in particular to TB, it should be noted that most domestic scientific publications associated with biological age-related changes in the organism, where geriatric age includes persons 60 years and older among both men and women, predominantly study the features of clinical manifestations of TB [11–16]. In foreign studies related to TB and age, the geriatric group also includes persons aged 60 years and older, where authors, like domestic researchers, more often describe clinical features of TB rather than medical and social aspects of the disease [17–21]. It is known that in Russia TB and HIV infection predominantly affect the able-bodied population from 20 to 45 years old [22–24]. In foreign studies, an assessment of the economic damage caused by SSIDs to society is widely available, which indirectly addresses gender and age differences among those affected by one or another SSID: the average age of TB and HIV-infected people in Ethiopia and Iran ranges from 30 to 40 years [25–27].

In the previous study, we pointed out that risk factors for the spread of TB in the general population are well studied both in Russia and abroad [28]. Meanwhile, studies devoted to the comprehensive assessment of risk factors for SSID spread among the population, with their division into WA and OWA groups, which is important from the point of view of public health, are practically not found in the scientific literature.

There are publications assessing the general morbidity and mortality of the able-bodied population of Russia, where a high mortality rate among them from external causes is noted [29, 30]. A significant excess of mortality in Russia among men and women of WA over similar indicators in European countries was determined [31]. Also among the able-bodied population the risk factors for the development of non-communicable diseases, especially cardiovascular and oncologic pathologies, are well studied [32–34].

AIM

On the basis of comparative analysis, to establish the leading risk factors for SSID spread (using TB as an example) among the population of WA and OWA with the subsequent development of scientific and practical measures to reduce the social burden of TB among the selected groups.

MATERIALS AND METHODS

A total of 1,497 respondents were interviewed in an ecological study conducted by face-to-face questionnaire survey of adults aged 18 and older in the Republic of North Ossetia-Alania (RNO-Alania), with cluster-nested selection of territories. The sample size was set based on the population of ~700,000 people in the region, with a margin of error of ±3.0% and 95% confidence interval, while maintaining quota ratios of respondents by gender, age and place of residence to the general population. All 9 administrative entities of RNO-Alania, including the city of Vladikavkaz, were included in the survey. The survey of participants was organized by sampling formed by respondents without identification data. The questionnaire consisted of 41 questions grouped into 8 blocks, which included information on: gender-age, behavioral, social and economical, medical, organizational, epidemiological, cultural-ethnic and environmental. The WA group consisted of respondents among males 18 to 59 years old, over OWA, 60 years old and above; females 18 to 54 years old and 55 years old and above, respectively. The study was conducted from January to October 2023, approved by the Ethical Committee "N.A. Semashko National Research Institute of Public Health". Statistical processing of the material was performed on the SPSS.26 platform. Differences in variables were established by Fisher's exact test with the

determination of the probability p value between the WA and OWA groups as a whole, as well as between men and women in these groups. In addition to general characteristics (sex, age, place of residence, ethnicity), only risk factors with significant differences in the compared groups are summarized in the article.

RESULTS

The total area of RNO-Alania is 8,000 km^2, with a population of 683,071 at the beginning of 2023. The main feature of the region is high population density — 85.23 people/km^2, by this criterion the republic ranks 5th among all subjects of the Russian Federation. In terms of gender composition, women prevail over men (55.2% vs. 44.8%), urban residents prevail over rural residents (63.2% vs. 36.8%). In terms of gross regional product per capita (293.4 thousand rubles), the republic belongs to regions with medium economic level. TB incidence in 2022 was slightly higher than the average for Russia as a whole, amounting to 31.5 per 100,000 population against 31.1.

According to the results of the environmental survey itself, the average age of all respondents was 47.26±14.3 years. In the WA group it was 41.75±10.7. In OWA group it was 66.59±6.2. In accordance with the quota characteristics, among all respondents women prevailed (56.6%), the majority lived in the city (68.7%), by ethnic composition 77.0% of respondents were Ossetians (Fig. 1). Among the compared groups, the above variables had no reliable differences (p >0.05), which allowed us to show general information.

Table 1 summarizes the risk factors for the spread of TB that have significant differences between the compared groups. In terms of marital status, more than 40% of respondents were single (divorced, single, widows, widowers), with OWA women 1.4 times more prevalent than WA women (p <0.0001); among all respondents. This difference between OWA and WA groups was 1.2 times (p <0.0001). Also, disability was 1.6 times more common among OWA women than WA women (p <0.044). Monthly salaries above 30,000 rubles were more common among WA men than OWA men (20.4% vs. 10.7%, p <0.025). This indicator was 1.4 times more prevalent among the WA group than among the OWA group (p <0.006).

More than 1/3 of the respondents indicated alcohol consumption, which was taken more often in the WA group than in the OWA group: it was 1.3 times more often among men (p <0.021) and 1.7 times more often among women (p <0.001) and 1.4 times more often overall (p <0.001). Heavy smokers (1 pack of cigarettes per day or more) were more likely to be OWA men (1.6 times) than WA men (p < 0.046). Among all respondents, OWA respondents were also more likely to be heavy smokers than WA individuals on this criterion (p <0.052).

Among the ethnocultural characteristics, there were differences between the compared groups only in commitment to national sports, where the WA group was more often engaged in them than the OWA group: men were engaged 7 times more often (p <0.0001), women were engaged 3.2 times more often (p <0.008), and overall 4.5 times more often (p <0.001). On environmental factors, about 1/4 of the questionnaire respondents noted problems of garbage disposal: among them women, and in general, WA persons were 1.5 times more often concerned about this problem than women and the whole OWA group (p <0.004, p <0.001, respectively).

According to medical and social factors, more than 60% of respondents consider themselves healthy, especially the OWA group: with a significant difference in relation to the OWA group among men by 1.6 times, among women by 2 times and by 1.7 times in general (p <0.0001). About 1/3 of respondents indicated the presence of chronic diseases with their predominance among the OWA group 2 times in relation to the WA group, both in general and among men and women separately (p <0.0001). About 1/4th of the respondents

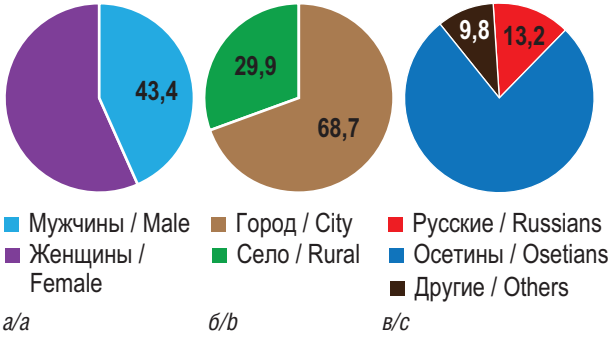

Fig. 1. Gender (*a*), residential (*b*) and ethnic (*c*) characteristics of respondents (%)

Рис. 1. Характеристика респондентов по полу (*а*), месту жительства (*б*) и этнической принадлежности (*в*) (%)

Table 1

Comparative analysis of tuberculosis risk factors among working- and older working-age groups (%)

Таблица 1

Сравнительный анализ факторов риска распространения туберкулеза среди групп трудоспособного и старшего трудоспособного возраста (%)

Факторы / Factors	**Пол / Gender Всего / Total**	**Всего / Total N=1497: М/М=673 Ж/F=824 (%)**	**Трудоспособный возраст / Working-age group N=1165: М/М =520; Ж/F=645 (%)**	**Старшего трудоспособного возраста / Older working-age group N=332: М/М= 153; Ж/F=179 (%)**	**P**
Социально-экономические факторы / Socio-economic factors					
Одинокий (ая) / Single	М/М	45,7	46,2	44,3	<0,0001
	Ж/F	42,1	39,0	53,4	<0,0001
	Всего/Total	43,8	42,2	49,3	<0,0001
Инвалидность / Disable	М/М	8,0	7,1	11,1	>0,08
	Ж/F	2,4	2,2	3,4	>0,254
	Всего/Total	4,9	4,4	6,9	<0,044
Зарплата в месяц больше 30 000 руб. / Monthly salary more than 30,000 rub	М/М	18,4	20,4	10,7	<0,025
	Ж/F	9,6	9,7	9,4	>0,060
	Всего/Total	13,4	14,3	10,0	<0,006
Поведенческие факторы / Behavioral factors					
Употребление алкоголя / Alcohol consumption	М/М	40,7	42,9	33,3	<0,021
	Ж/F	26,9	29,6	17,3	<0,001
	Всего/Total	33,1	35,5	24,7	<0,001
Тяжелый курильщик / Heavy smoker	М/М	11,0	9,6	15,7	<0,046
	Ж/F	1,2	1,6	0,00	–
	Всего/Total	5,6	5,2	7,2	<0,052
Этнокультурные факторы / Ethnic-cultural factors					
Национальный вид спорта / National type of sport	М/М	7,4	9,2	1,3	<0,0001
	Ж/F	6,1	7,1	2,2	<0,008
	Всего	6,7	8,1	1,8	<0,0001
Экологические факторы / Ecologic factors					
Проблемы вывоза мусора / Garbage removal problems	М/М	19,3	20,6	15,0	>0,077
	Ж/F	26,8	29,0	19,0	<0,004
	Всего/Total	23,4	25,2	17,2	<0,001
Медико-социальные факторы / Medico-social factors					
Здоров / Healthy	М/М	62,9	68,3	43,4	<0,0001
	Ж/F	59,2	65,3	34,0	<0,0001
	Всего/Total	60,9	66,6	38,5	<0,0001
Имеет хронические заболевания / Have chronic diseases	М/М	29,8	25,5	45,6	<0,0001
	Ж/F	32,2	26,7	55,3	<0,0001
	Всего/Total	31,1	26,1	50,7	<0,0001
Плохое здоровье из-за плохого питания / Poor health due to poor nutrition	М/М	19,0	19,0	19,0	>0,543
	Ж/F	23,5	25,3	17,3	<0,015
	Всего/Total	21,5	22,5	18,1	<0,048
Из-за проблем экологии / Due to ecologic issues	М/М	21,2	24,0	11,1	<0,0001
	Ж/F	23,5	24,5	20,1	>0,130
	Всего/Total	22,4	24,3	16,0	<0,001

Ending of the table 2 / Окончание табл. 2

Факторы / Factors	Пол / Gender Всего / Total	Всего / Total N=1497: М/М=673 Ж/F=824 (%)	Трудоспособный возраст / Working-age group N=1165: М/М =520; Ж/F=645 (%)	Старшего трудоспособного возраста / Older working-age group N=332: М/М= 153; Ж/F=179 (%)	P
Медико-организационные факторы / Medical and health care management factors					
Врачебные амбулатории / Medical ambulatories	М/М	20,2	20,8	18,3	>0,293
	Ж/F	16,1	17,7	10,6	<0,013
	Всего/Total	18,0	19,1	14,2	<0,023
Старое медоборудование / Old medical equipment	М/М	14,7	15,0	13,7	>0,403
	Ж/F	19,4	21,2	12,8	<0,007
	Всего/Total	17,3	18,5	13,3	<0,015
Есть смартфон / Have a smartphone	М/М	78,5	83,7	60,8	<0,0001
	Ж/F	80,2	84,8	63,7	<0,0001
	Всего/Total	79,4	84,3	62,3	<0,0001
Одобрение телемедицины / Approval of telemedicine	М/М	36,8	40,6	24, 2	<0,001
	Ж/F	31,9	32,9	28,5	>0,173
	Всего/Total	34,1	36,3	26,5	<0,002
Эпидемиологический фактор / Epidemiological factor					
Болел/болею ТБ / Had/have the TB	М/М	20,4	19,8	22,2	>0,292
	Ж/F	7,2	5,9	11,7	<0,008
	Всего/Total	13,1	12,1	16,6	<0,023
Избегает контакта с ТБ / Avoid TB contact	М/М	64,8	64,8	64,7	>0,527
	Ж/F	65,0	67,8	55,3	<0,001
	Всего/Total	64,9	66,4	59,6	<0,013
Тесные родственные отношения / Close relative relations	М/М	34,2	34,2	34,0	>0,519
	Ж/F	31,1	29,5	36,9	<0,037
	Всего/Total	32,5	31,6	35,5	<0,099
Влияние традиций на ТБ / Influence of traditions on TB	М/М	57,4	54,0	68,6	<0,001
	Ж/F	51,1	49,1	58,1	<0,021
	Всего/Total	53,9	51,3	63,0	<0,0001

associated poor health with poor nutrition, especially the WA group as a whole and women at the same age, with a difference of 1.2 and 1.5 times in relation to the OWA group, respectively ($p < 0.048$ and $p < 0.015$). The association of poor health with environmental disturbance was reported predominantly by WA men ($p < 0.0001$) and WA respondents in general ($p < 0.001$).

Medical care by availability of outpatient clinics is less accessible to the OWA group than to the WA group, with a difference of 1.3 times ($p < 0.023$) overall and 1.7 times ($p < 0.013$) among women of the same age. Wear and tear of medical equipment in use was 1.4 times more often indicated by the WA group than the OWA group ($p < 0.015$), especially by women ($p < 0.007$). Telephone communication when a smartphone was less accessible to the OWA group than the WA group, with a difference of 1.4 times, both overall and among men and women ($p < 0.0001$). The use of telemedicine in health care was significantly more frequently endorsed by the WA group, especially men, than by the OWA group, with a difference of 1.4 and 1.8 times, respectively ($p < 0.002$ and $p < 0.0001$).

When assessing epidemiologic factors, past and present TB disease was indicated by more than 10% of respondents, mostly from the OWA group, especially women, with a difference of 2-fold ($p < 0.008$) among women in relation to the WA group and 1.3-fold ($p < 0.002$) among

participants overall. However, OWA women and the OWA group as a whole were less likely to avoid a TB patient relative, colleague, neighbor, acquaintance in order to "not offend" them ($p < 0.001$ and $p < 0.013$). They also indicate the influence of close family ties on the spread of TB in the population with a significant difference in relation to the WA group ($p < 0.037$ and $p < 0.099$). This group also recognizes the influence of traditions (weddings, funerals, etc.) on the rapid and massive spread of respiratory infections, especially during epidemics ($p < 0.0001$).

DISCUSSION

Our study, which correctly reflects the main characteristics of the general population by the method of conducting, is the first work on the study of the leading risk factors of SSID on the example of TB among the population of WA and OWA in a region with high population density and historical and cultural peculiarities. The findings confirm the high health vulnerability of the OWA population (fewer healthy people, more people with chronic diseases, TB) [10]. OWA people are also more vulnerable, especially women, socially and economically (more likely to be single, more likely to have a disability, less likely to earn money), and have less access to health care, including measures related to digital technologies (fewer people have smartphones that can be used to remotely monitor health care delivery). At the same time, the OWA population is more conservative, with less approval of the use of digital technologies in medicine, in particular telemedicine; they are more committed to national traditions with the preservation of close family ties, while realizing their negative role in the spread of SSID. Unexpectedly, we found a higher frequency of heavy smokers among OWA men than among WA men, which exacerbates the influence of the medical and social factor on the spread of SSID among them.

The leading risk factors for TB in the WA population are behavioral (alcohol use), nutritional (poor diet) and environmental. On the positive side, the WA population has higher earnings, especially for men, is more likely to participate in sports (national sports) and is more progressive (more likely to have modern digital gadgets, approve of telemedicine and recognize worn and old medical equipment).

CONCLUSION

During the period of implementation of the pension reform in Russia, in order to reduce the impact of socially significant infectious diseases on the quality of public health, it is necessary to take into account not only health problems in the population of older working age, but also the issues of their social and economical adaptation, conservatism and historical and cultural characteristics of the inhabitants of the regions. Attention should also be paid to behavioral, nutritional and environmental risk factors for the spread of socially significant infections (tuberculosis) among the population, especially among the working-age group.

ADDITIONAL INFORMATION

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

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

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

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

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

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

Информированное согласие на публикацию. Авторы получили письменное согласие анкетируемых на публикацию данных.

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MEDICAL, SOCIAL AND ECONOMIC CONSEQUENCES OF DISEASES OF THE EAR AND MASTOID PROCESS

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ABSTRACT. The analysis of medical, social and economic consequences for various pathologies considers a number of aspects, including the study of morbidity, temporary and permanent disability, economic losses, allowing us to highlight the main directions of treatment and preventive measures. The purpose of the study is to assess the economic damage and medical and social consequences of ear and mastoid diseases in the Russian Federation. Indicators of temporary disability, disability, and economic losses were calculated on the basis of the analyzed Materials of official statistics published by Rosstat and the Ministry of Labor. A forecast of population disability has been made. It has been shown that the proportion of cases of temporary disability due to diseases of the ear and mastoid process ranges from 0.6 to 0.9 % of all causes. During the period 2015–2020 from 0.19 to 0.23 cases and from 1.98 to 2.60 days of temporary disability per 100 workers was fixed. The average duration of temporary disability ranged from 10.2 to 11.4 days. Economic losses from initial disability in adults account for 3/4 of the total amount of damage. When predicting the occurrence of primary disability in children, an insignificant tendency towards its decrease was established, while in adults — towards an increase in this indicator. Economic losses due to diseases of the ear and mastoid process reach more than 27.87 billion rubles per year, which is 0.03 % of the country's gross domestic product. Thus, the proportion of cases of temporary disability due to diseases of the ear and mastoid process is comparatively small, but the economic losses from this pathology are quite significant, which requires improved approaches to providing treatment and preventive measures.

KEYWORDS: diseases of the ear and mastoid process, medical, social and economic consequences, temporary disability, primary disability, economic losses

МЕДИКО-СОЦИАЛЬНЫЕ И ЭКОНОМИЧЕСКИЕ ПОСЛЕДСТВИЯ ЗАБОЛЕВАНИЙ УХА И СОСЦЕВИДНОГО ОТРОСТКА

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РЕЗЮМЕ. Анализ медико-социальных и экономических последствий при различной патологии складывается из ряда аспектов, включающих изучение заболеваемости, временной и стойкой утраты трудоспособности, экономических потерь, что позволяет выделить основные направления лечебно-профилактических мероприятий. Цель исследования — оценка экономического ущерба и медико-социальных последствий болезней уха и сосцевидного отростка в Российской Федерации. Использованы материалы официальной статистики, опубликованные Росстатом и Минтруда, на основе которых рассчитаны показатели временной нетрудоспособности, инвалидизации, экономические потери. Сделан прогноз инвалидизации населения. Показано, что доля случаев временной нетрудоспособности по поводу болезней уха и сосцевидного отростка составляет от 0,6 до 0,9 % от всех причин. В период 2015–2020 гг. на 100 работающих приходилось от 0,19 до 0,23 случаев и от 1,98 до 2,60 дней временной нетрудоспособности. Средняя длительность временной нетрудоспособности колебалась от 10,2 до 11,4 дней. Экономические потери от первичного выхода на инвалидность у взрослых составляют 3/4 от общей суммы ущерба. При прогнозировании возникновения первичной инвалидизации у детей установлена слабо выраженная тенденция к ее снижению, а у взрослых — к росту данного показателя. Экономические потери при заболеваниях уха и сосцевидного отростка достигают более 27,87 млрд рублей в год, что составляет 0,03 % валового внутреннего продукта страны. Таким образом, доля случаев временной нетрудоспособности в связи с болезнями уха и сосцевидного отростка невелика, однако экономические потери от этой патологии достаточно существенны, что требует совершенствования подходов к обеспечению лечебно-профилактических мероприятий.

КЛЮЧЕВЫЕ СЛОВА: болезни уха и сосцевидного отростка, медико-социальные и экономические последствия, временная нетрудоспособность, первичная инвалидизация, экономические потери

INTRODUCTION

The problem of the analysis of medical, social and economic consequences of various pathologies is one of the key issues in the science of public health, representing the reflection of various aspects of the concept of health and well-being of the population. It consists of a number of aspects, including the study of morbidity, temporary and permanent disability, as well as economic losses as a result of diseases, allowing us to identify the main directions of therapeutic, preventive and rehabilitative measures [1–7].

It is known that the medical and social significance of a particular pathology is determined by the economic damage inflicted on society, expressed by morbidity, mortality, and temporary and permanent disability. At the same time, these indicators allow us to assess the state of the health care system, analyze its weaknesses and identify ways to further improve it [8–10].

Indicators of temporary and permanent disability make it possible to assess more fully the condition of the population engaged in economic activity, which is especially important in conditions of increasing life expectancy and pension reform, when the age of those employed in labor activity will increase due to the increase in life expectancy and pension reform. In recent years, researchers have noted a tendency to improve the health of the working population, which is expressed in the positive dynamics of indicators of temporary disability and a decrease in the level of primary disability of the adult population at the expense of young and middle-aged people, both in general and in some nosological forms, which allows to reduce economic losses.

It should be taken into account that the indicators of temporary disability can be influenced by working conditions of different industries, the presence of harmful industries in a particular territory, and climatic conditions [11–21].

Diseases of the ear and mastoid process are an urgent medical and social problem, having a significant impact on human health, which is associated, among other things, with the important role of the hearing and speech organs in human socialization and communication. Hearing, along with speech, is not only a tool for communication, it is the instrument that allows an individual to develop harmoniously and interact in society. Diseases of the ear and mastoid can lead to disability of the patient due to the violation of the communicative component, and purulent complications of this pathology such as meningitis, brain abscesses, sepsis can cause death [22–25].

AIM

The aim of the study is to assess the economic damage and medical and social consequences of ear and mastoid diseases in the Russian Federation.

MATERIALS AND METHODS

The study used materials of official statistics published by the Federal State Statistics Service (Rosstat) and the Ministry of Labor. The indicators of temporary disability due to diseases of the ear and mastoid process were calculated (the share of this pathology among all cases of diseases with temporary disability, the number of cases and days of disability per 100 workers, the average duration of a case of disability). The indicators of primary disability in children (up to 18 years of the age) and adults were studied, and relative indicators were calculated. Regression analysis with calculation of the coefficient of determination R^2 was carried out to predict the dynamics of the indicators of disability of the child and adult population of the Russian Federation from diseases of the ear and mastoid process. The economic losses from morbidity and disability of the population from diseases of the ear and mastoid process were calculated based on the methodology approved by the orders of the Ministry of Economic Development of the Russian Federation, the Ministry of Health and Social Development of the Russian Federation, the Federal State Statistics Service dated 10.04.2012.

RESULTS AND DISCUSSION

The survey data show that during the last years the share of cases of temporary disability due to diseases of the ear and mastoid process has been stable, and their specific weight in the structure of all cases of temporary disability is 0.6–0.9% (Table 1).

The calculation of the number of cases per population employed in economic activity revealed that the indicator of the number of cases of temporary disability per 100 workers tended to decrease. Thus, in 2015–2016, there were 0.23 cases of temporary disability due to ear and mastoid diseases per 100 workers. In 2017–2019 there were 0.22 cases, and in 2020 this indicator decreased to 0.19 cases.

The data on the calculation of the number of days of temporary disability for ear and mastoid diseases per 100 employees indicate that it also tended to decrease with a slight peak in 2016. Specifically, in 2015, the number of days of temporary disability for ear and mastoid diseases was 2.39; in 2016 it was 2.60; in 2017 it was 2.27; in 2018 it was 2.29; in 2019 it was 2.14; and in 2020 it was 1,98.

The average duration of temporary disability was calculated, which ranged from 10.2 to 11.4 days during the analyzed period. The indicator

Table 1

The share of cases of temporary disability due to diseases of the ear and mastoid process in the structure of all causes in 2015–2020 (in absolute figures and % of total)

Таблица 1

Доля случаев временной нетрудоспособности в связи с болезнями уха и сосцевидного отростка в структуре всех причин в 2015–2020 гг. (в абс. цифрах и % к итогу)

Год / Year	Болезни уха и сосцевидного отростка / Diseases of the ear and mastoid process		Все заболевания / All diseases	
	Абс.	%	Абс.	%
2015	170 430	0,9	19 648 688	100,0
2016	163 887	0,8	19 531 542	100,0
2017	159 365	0,8	19 443 172	100,0
2018	159 378	0,8	19 577 934	100,0
2019	147 329	0,8	19 005 988	100,0
2020	129 770	0,6	23 205 130	100,0

was minimum in 2015 and 2016 (10.2 days). It was slightly higher in 2018–2019 (10.3 days) and 2020 (10.6 days), and its maximum value was observed in 2016 (11.4 days).

The study showed that during 2005–2022, there were wave-like fluctuations in the primary disability rate of the pediatric population due to ear and mastoid diseases (Table 2).

There was a significant increase in the rate of primary disability among children in 2006 — by 105.0%, which amounted to 1,078.7 cases per 10,000 children (the baseline of 2005 year is 526.3 cases). In 2007–2009, there was a steady downward trend in this indicator, and the increase compared to the baseline in this period amounted to 70.0–86.4% (894.5–980.8 cases per 10,000 people). In 2010, there was again an increase in the primary disability rate by 88.7 % from the initial level. In the subsequent period from 2011 to 2022, there was a progressive decline to 179.5–682.4 cases with slight rises in 2014 and 2022 (949.8 and 871.4 cases per 10,000 people, respectively).

This trend is confirmed in predicting the occurrence of primary disability in children: the coefficient of determination R^2=0.27, that is, there is a weakly expressed tendency to decrease the level of this indicator (Fig. 1).

The data of the study indicate that, in contrast to children, in adults, according to the data for 2000–2022, there is a lower level of primary disability from diseases of the ear and mastoid process, but the tendency to its growth prevails

Table 2

Dynamics of primary disability due to pathology of the ear and mastoid process in the Russian Federation in 2005–2022 among persons under 18 years of age (per 10,000 child population)

Таблица 2

Динамика первичной инвалидизации при патологии уха и сосцевидного отростка в Российской Федерации в 2005–2022 гг. среди лиц до 18 лет (на 10 000 детского населения)

Год / Year	Показатель первичной инвалидизации (на 10 000 чел.) / Primary disability rate (per 10,000 people)	Показатель наглядности (%) / Visibility Score (%)
2005	526,3	100,0
2006	1078,7	205,0
2007	980,8	186,4
2008	906,9	172,3
2009	894,5	170,0
2010	993,0	188,7
2011	937,7	178,2
2012	929,4	176,6
2013	873,2	165,9
2014	949,8	180,5
2015	946,1	179,8
2016	944,9	179,5
2017	927,9	176,3
2018	905,0	172,0
2019	805,8	153,1
2020	682,4	129,7
2021	748,4	142,2
2022	871,4	165,6

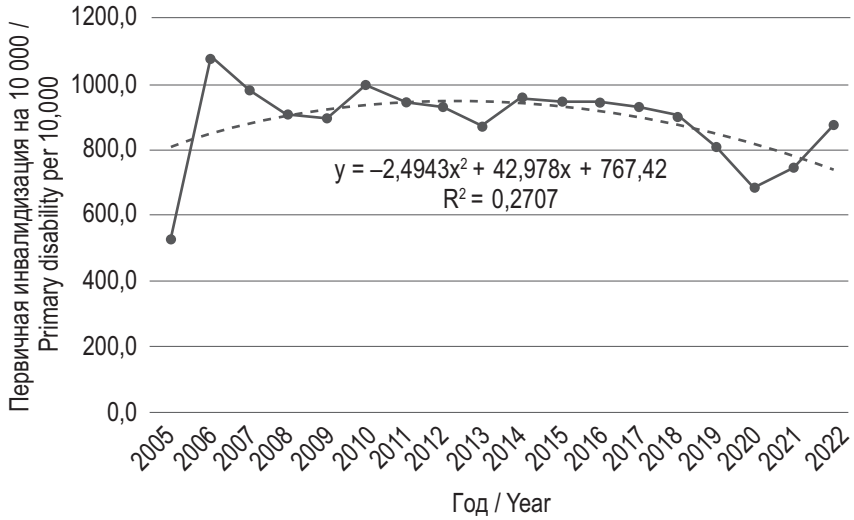

Fig. 1. Prognosis of the dynamics of primary disability among the child population from diseases of the ear and mastoid process

Рис. 1. Прогноз динамики первичной инвалидизации среди детского населения от болезней уха и сосцевидного отростка

(Table 3). At the same time, the wave-like dynamics is much less pronounced. Thus, in 2001–2002, as compared to 2000, there was a 20% increase in the primary disability of the adult population from diseases of the ear and mastoid process. By 2005–2006 the level of primary disability of the adult population from diseases of the ear and mastoid process increased more significantly, and the increase was 100–140% (up to 1.0–1.2 cases per 10,000 people). A slight decrease in the level of primary disability of the adult population from diseases of the ear and mastoid was observed in 2007–2014, but compared to 2000, the increase in the indicator was 80%. Further, in 2015–2022, the growth of primary disability of the adult population from diseases of the ear and mastoid process was again observed, and the increase was 100–180% of the initial one.

Table 3

Dynamics of primary disability of the adult population from ear and mastoid diseases in the Russian Federation in 2000–2022 (per 10,000 people)

Таблица 3

Динамика первичной инвалидизации взрослого населения от болезней уха и сосцевидного отростка в Российской Федерации в 2000–2022 гг. (на 10 000 человек)

Год / Year	Показатель первичной инвалидизации (на 10 000 чел.) / Primary disability rate (per 10,000 people)	Показатель наглядности (%) / Visibility Score (%)
2000	0,5	100,0
2001	0,6	120,0
2002	0,6	120,0
2003	0,5	100,0
2004	0,6	120,0
2005	1,0	200,0
2006	1,2	240,0
2007	0,9	180,0
2008	0,9	180,0
2009	0,9	180,0
2010	0,9	180,0
2011	0,9	180,0
2012	0,9	180,0
2013	0,9	180,0
2014	0,9	180,0
2015	1,0	200,0
2016	1,1	220,0
2017	1,3	260,0
2018	1,4	280,0
2019	1,5	300,0
2020	1,2	240,0
2021	1,3	260,0
2022	1,4	280,0

The obtained data are confirmed by the results of regression analysis (Fig. 2). According to the forecast, further growth of primary disability among the adult population is possible in the near future (the coefficient of determination R^2 is 0.74, which corresponds to the average level).

Economic losses were calculated on the basis of official statistics provided by the Federal State Statistics Service and the Ministry of Labor in accordance with the calculation methodology defined by the order of the Ministry of Economic Development, the Ministry of Health and the Federal State Statistics Service dated 10.04.2012 "On approval of the methodology for calculating economic losses from mortality, morbidity and disability of the population" [25].

No economic losses from mortality directly from diseases of the ear and mastoid process were recorded during 2000–2021, because these patients die from complications, which are recorded by official statistics as the main diagnosis. For the calculation of economic losses, the data for 2019, as the last pre-documentation year, were taken.

Economic losses from primary disability are the amount of lost profit in the production of gross domestic product due to the withdrawal of the patient from the production sphere in connection with the emergence of permanent disability and the registration of disability. This is the difference between the gross domestic product that could have been produced by persons who became disabled and the gross domestic product produced by working disabled persons (the calculations do not take into account the reduction in working hours and increased vacation for this group of disabled persons). The data on the number of persons with a primary permanent loss of working ability, the gross domestic product of the Russian Federation, and the number of the working population were obtained from materials published by the Federal State Statistics Service and the Ministry of Labor.

Thus, the lost profits are equal to:

$$LP_{pd} = (GDP : NE \cdot ND) - (GDP : NE \cdot WD),$$

where LP_{pd} — lost profit from the primary disability due to diseases of the ear and mastoid; GDP — gross domestic product; NE — the

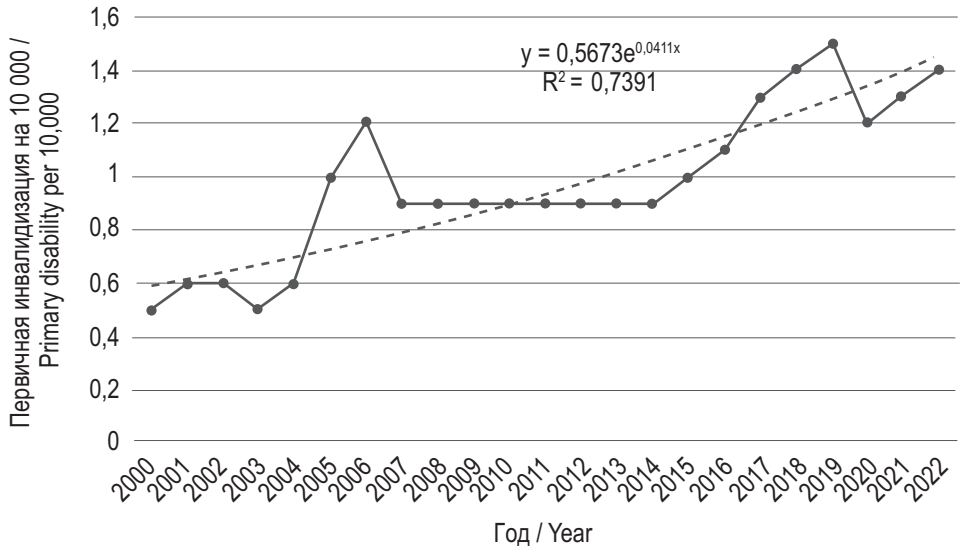

Fig. 2. Prognosis of the dynamics of primary disability among the adult population from diseases of the ear and mastoid process

Рис. 2. Прогноз динамики первичной инвалидизации среди взрослого населения от болезней уха и сосцевидного отростка

number of employed in the economy; ND — the number of those who were initially disabled due to diseases of the ear and mastoid; WD — the number of working disabled due to diseases of the ear and mastoid (taken as 18.6%) [21].

In 2019, the gross domestic product of the Russian Federation amounted to 110.046 trillion rubles, the total number of persons working in the economy was 71,064.5 thousand, the number of persons who became disabled for the first time due to diseases of the ear and mastoid process was 17.000.

Thus, the lost profit due to the first-time disability due to diseases of the ear and mastoid process in 2019 amounted to:

$$LP_{pd} = (110\,046\,000\,000\,000 : 71\,064\,500 \times 17\,000) - (110\,046\,000\,000\,000 : 71\,064\,500 \times 3162) = 21\,428\,653\,519 \text{ rub.}$$

Economic losses due to morbidity from ear and mastoid diseases represent the lost profit due to underproduction of gross domestic product due to temporary withdrawal of a worker from the production process due to the onset of temporary disability. Economic losses due to morbidity from ear and mastoid diseases were calculated as the product of the number of days of temporary disability by the gross domestic product produced by one worker per working day. Data on temporary disability, gross domestic product of the Russian Federation, and the number of working population were obtained from materials published by the Federal State Statistics Service.

Thus, the lost profit in connection with morbidity with temporary disability in ear and mastoid diseases is equal to:

$$LP_{dtd} = NDTD \cdot (GDP : NE : NDY),$$

where LPdtd — lost profit in ear and mastoid diseases with temporary disability; NDTD — number of days of temporary disability due to ear and mastoid diseases; GDP — gross domestic product; NE — number of employed in the economy; NDY — number of days in a year (taken as 365 days).

Therefore, the lost profit due to ear and mastoid disease incidence in 2019 is:

$$LP_{dtd} = 1\,519\,168 \cdot (110\,046\,000\,000\,000 / 71\,064\,500 : 365) = 6\,445\,172\,024 \text{ rub.}$$

In general, economic losses in ear and mastoid diseases are equal to the sum of the lost profit from primary disability and lost profit in diseases with temporary disability.

$$EL = LP_{pd} + LP_{dtd} = 21\,428\,653\,519 + 6\,445\,172\,024 = 27\,873\,825\,543 \text{ rub.}$$

Thus, economic losses in ear and mastoid diseases amount to more than 27.87 billion rubles, which is equal to almost 0.03% of the country's gross domestic product (GDP).

CONCLUSION

1. The analysis of primary disability from diseases of the ear and mastoid process among the child population of the Russian Federation shows a multidirectional dynamics of this indicator in the period from 2005 to 2022, but the possibility of its growth in the near future is not excluded.

2. In the Russian Federation there is a tendency of growth of primary disability of the adult population from diseases of the ear and mastoid process, and the possibility of continuation of unfavorable dynamics is not excluded. The obtained data indicate the expediency of an in-depth analysis of the causes of the growth of primary disability from diseases of the ear and mastoid process in the adult population of the Russian Federation.

3. Economic losses from morbidity of the adult population of the Russian Federation due to ear and mastoid diseases reach 27.87 billion rubles per year, which is about 0.03% of the gross domestic product of the country. At the same time 3/4 of this amount falls on the primary disability of the able-bodied population.

4. In the structure of all causes of temporary disability, the share of diseases of the ear and mastoid process is relatively small. However, economic losses from this pathology are quite significant, which requires improvement of organizational measures to ensure timely implementation of therapeutic and preventive measures among the able-bodied population of the Russian Federation.

ADDITIONAL INFORMATION

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

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

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

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

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

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

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

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

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UROLITHIASIS PREVENTION WITHIN A PRIMARY HEALTH CARE

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ABSTRACT. The state policy of Russia in the field of healthcare is aimed at the prevention of different diseases. The detection of urolithiasis is not the subject of annual medical examination of the adult population, while there are no clear requirements for preventive measures at different levels, including dispensary supervision. In order to assess the completeness of the implementation of urolithiasis prevention, reporting forms No. 12 for 2018–2022 and data from primary accounting documents of medical organizations in St. Petersburg on the volume of medical care provided under the Program of state guarantees of free medical care to citizens in 2022 were analyzed. Extensive and intensive indicators, dynamic series indicators were calculated, and the reliability of the difference in Student' indicators was assessed. In 2022, 34,972 adult patients with urolithiasis were registered in St. Petersburg, 15.3 % of them were detected for the first time. The primary incidence of urolithiasis in adults is stable (in 2018 — 1.22 per 1000 adults, in 2019 — 1.15, in 2022 — 1.21). The contribution of medical examination to the detection of urolithiasis is significantly less in 2018–2019 than in 2022 — 1.6 %, 3.1 % and 8.3 %, respectively. In 2022, 32.6 % of the total number of patients with urolithiasis were under medical supervision, in 2018 — 28.1 %. The coverage of dispensary supervision of people of working age is higher than in older age groups — 36.9 % in 2022, 34.4 % in 2018. Indirect signs of unsatisfactory prevention of urolithiasis can be considered a high level (55.4 %) of hospitalization, its low share (9.8 %) in the volume of primary health care and high (62.5 %) in the volume of emergency medical care for diseases of the urinary system. Levelling the risks of developing urgent situations based on the completeness of the implementation of preventive measures, including informing patients, is the most important link in the formation of a patient-centered urolithiasis control system.

KEYWORDS: urolithiasis, medical examination of the adult population, medical supervision, active detection of chronic diseases

РЕАЛИЗАЦИЯ ПРОФИЛАКТИКИ МОЧЕКАМЕННОЙ БОЛЕЗНИ В РАМКАХ ПЕРВИЧНОЙ МЕДИКО-САНИТАРНОЙ ПОМОЩИ

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РЕЗЮМЕ. Государственная политика России в сфере здравоохранения направлена на профилактику заболеваний. Выявление мочекаменной болезни не является предметом ежегодной диспансеризации взрослого населения, при этом для этого заболевания не установлены четкие требования к профилактическим мероприятиям разных уровней, в том числе к диспансерному наблюдению. В целях оценки полноты реализации профилактики мочекаменной болезни проанализированы отчетные формы № 12 за 2018–2022 годы и данные первичных учетных документов медицинских организаций Санкт-Петербурга об объемах медицинской помощи, предоставленной в рамках Программы государственных гарантий бесплатного оказания гражданам медицинской помощи в 2022 году. Рассчитаны экстенсивные и интенсивные показатели, показатели динамического ряда, проведена оценка достоверности разности показателей по Стьюденту. В 2022 году в Санкт-Петербурге зарегистрировано 34 972 взрослых больных мочекаменной болезнью, у 15,3% из них заболевание выявлено впервые. Первичная заболеваемость взрослых мочекаменной болезнью стабильна (в 2018 году — 1,22 на 1000 взрослого населения, в 2019 году — 1,15, в 2022 году — 1,21). Вклад диспансеризации в выявление мочекаменной болезни существенно меньше в 2018–2019 годах, чем в 2022 — 1,6, 3,1 и 8,3 % соответственно. В 2022 году под диспансерным наблюдением состояло 32,6 % общего числа больных мочекаменной болезнью, в 2018 году — 28,1 %. Охват диспансерным наблюдением лиц трудоспособного возраста выше, чем в старших возрастных группах, — 36,9 % в 2022 году, 34,4 % — в 2018 году. Косвенными признаками неудовлетворительной профилактики мочекаменной болезни можно считать высокий уровень (55,4 %) госпитализации, низкую ее долю (9,8 %) в объеме оказания первичной медико-санитарной помощи и высокую (62,5 %) в объеме оказания скорой медицинской помощи при заболеваниях мочевой системы. Нивелирование рисков развития ургентных ситуаций на основе полноты реализации профилактических мероприятий, в том числе информирования больных, является важнейшим звеном формирования пациентоцентричной системы контроля мочекаменной болезни.

КЛЮЧЕВЫЕ СЛОВА: мочекаменная болезнь, диспансеризация взрослого населения, диспансерное наблюдение, активное выявление хронических заболеваний

INTRODUCTION

In recent years, the state policy of the Russian Federation in the field of health care is aimed at disease prevention. Preventive programs are fully supported and developed, the coverage of citizens by health check-ups and other preventive examinations, the main task of which is the early detection of chronic non-communicable diseases [1, 2]. Urolithiasis is a widespread chronic non-communicable disease that should be diagnosed in the majority of cases before complications and emergencies develop. Although the detection of urolithiasis is not a goal of health check-ups, in certain groups of adults the disease may be suggested. It can be clarified by subsequent examination of the patient.

When carrying out the above preventive measures, the following are performed: laboratory examination of the patient, including a urinalysis, blood analysis, as well as a medical examination with the taking of anamnesis [3]. This makes it possible to identify risk factors for urolithiasis and, in some cases, its manifestation. It is also

possible to suspect urolithiasis in patients of fertile age within the framework of a two-stage examination carried out during the assessment of reproductive health of women and men, which has recently been included in the Program of State Guarantees of Free Medical Care for 2024 and for the planning period of 2025 and 2026 [4]. The relevant methodological recommendations developed by the Ministry of Health of the Russian Federation [5] provide for the identification of signs and risk factors for the development of diseases that have a negative impact on pregnancy, labor and postpartum period: examination and consultation by a gynecologist, examination and consultation of men by an urologist, laboratory examination to detect infectious agents of the pelvic organs, ultrasound examination of the pelvic organs, ultrasound examination of the prostate gland and scrotal organs. Reproductive health check-up should be carried out simultaneously with preventive examinations and health check-up of certain groups of the adult population. Performing the entire set of these examinations makes it possible to increase the frequency of suspected urolithiasis and to plan further treatment and diagnostic measures necessary for specific patients.

If urolithiasis is detected, patients should be placed under dynamic medical follow-up. Implementation of this task, as well as preventive examination and health check-up, is at the level of the primary health care organization [6–8].

The current normative legal documents in the field of health care do not currently establish uniform requirements for medical follow-up in urolithiasis [9–11]. The standard of medical care for adults with urolithiasis does not use the term “medical follow-up” [12], and individual or group preventive counseling as a preventive method is not provided. At the same time, this normative document outlines the main components of annual monitoring of the course of the disease. Moreover, the section containing recommendations on medical follow-up is absent in the clinical recommendations “Urolithiasis” [11], which does not correspond to the established standard form of such documents [13]. It is recommended to assess the quality of medical care for urolithiasis without taking into account the criterion reflecting the patient’s awareness of the most effective methods of prevention.

It should be noted that the lack of established regulatory requirements for preventive measures in urolithiasis does not reduce their importance. Timely preventive control of clinical and diagnostic parameters, as well as raising patients’ awareness of adverse risk factors for the development of the disease and its complications are the most important links in the patient-centered system of medical care, which allows, among other things, to reduce the risks of the need for its provision in emergency and urgent forms [14–17]. In this regard, the analysis of the organization of preventive measures at various levels in patients with urolithiasis seems to be very relevant for the further preparation of management decisions that reduce medical and social risks for patients in this group.

AIM

The aim of the study is to evaluate the completeness of the implementation of preventive measures in urolithiasis.

MATERIALS AND METHODS

The data of the statistical observation form No. 12 “Information about the number of diseases registered in patients living in the service area of a medical organization” of St. Petersburg medical organizations for the period 2018–2022 were analyzed. The number of adult patients with urolithiasis, including those detected for the first time, those detected during preventive measures, and those under medical follow-up was studied. Extensive and intensive indices, dynamic series indices were calculated, and the reliability of the difference between the indices was assessed by Student’s test. In addition, according to the data of primary accounting documents of medical organizations participating in the implementation of the Program of state guarantees of free medical care in St. Petersburg for 2022, the volumes of medical care provided to the adult population for diseases of the urinary system, including urolithiasis, by its types were studied: primary medical and sanitary care in outpatient and day hospital conditions, specialized medical care in 24-hour hospital conditions, emergency medical care. Extensive indicators were calculated.

RESULTS

In 2022, 34,972 patients with urolithiasis aged 18 years and older were registered in St. Petersburg, of whom 5,339 (15.3%) were detected for the first time. More than half (64.9%) of the first-time patients with urolithiasis were of the working age.

Of the first-time patients diagnosed with urolithiasis, only 441 were diagnosed during preventive measures; the indicator "contribution of health check-ups of certain groups of the adult population to the detection of urolithiasis" was 8.3%. Of all detected patients with urolithiasis, only 7.9% were of the working age.

Trends in the primary detection of urolithiasis among adults remained relatively stable in St. Petersburg during the last five-year period. In 2018 5,464 patients were diagnosed. In 2022 — 5,159 patients were diagnosed, which corresponds to the value of the primary incidence rate of adult urolithiasis of 1.22 and 1.15 per 1,000 adults, respectively ($t < 2$). However, the above activity of detection of urolithiasis in preventive measures allowed to achieve a higher indicator of "contribution of health check-up to the detection of urolithiasis" in the last years of the studied period. The value of the indicator amounted to 1.6% in 2018, 3.1% in 2019, while in 2022 it is already 8.3%. At the same time, the similar indicator for diseases of the genitourinary system as a whole did not change significantly and amounted to 3.9% in 2018 and 3.1% in 2022.

In recent years, the coverage of patients suffering from urolithiasis by medical follow-up has not been fully ensured. In 2022, 12,755 people were under medical follow-up, accounting for 32.6% of the total number of patients with urolithiasis. Five years earlier, in 2018, there were 11,528 people under medical follow-up, with a similar coverage rate of 28.1%.

In the group of patients older than working age, there is also a positive trend in the coverage of patients with urolithiasis by medical follow-up. It should be noted that in 2022, the indicator in the group of persons older than working age was 32.9% and did not statistically differ from that in the adult population as a whole ($t<2$). In previous periods, however, it was significantly lower, 24.1% in 2018 ($t=2.8$; $p <0.05$).

In the group of patients of working age, the coverage of medical follow-up of patients with urolithiasis is slightly higher than in the group of patients of older age groups. It was 36.9% in 2022 and 34.4% in 2018, but this value of the indicator also cannot be called satisfactory.

It should be noted that the value of medical follow-up coverage is currently higher among patients with newly diagnosed urolithiasis. Thus, in 2022, 42.9% of patients with urolithiasis diagnosed for the first time in St. Petersburg were taken under medical follow-up, which is statistically significantly higher than among patients who had such a diagnosis at the end of 2022 (32.6%, $t=3.6$, $p <0.05$). The trend for this indicator also shows a stable increase, which amounted to 26.9% in 2022 relative to 2018.

At the same time, despite the positive dynamics of medical follow-up coverage of patients with urolithiasis, the preventive orientation of the organization of medical care for this disease is clearly insufficient. An indirect sign confirming this can be considered a high level of hospitalization of patients with this disease, which amounted to 55.4% in St. Petersburg in 2022. At the same time, in most cases such hospitalizations are emergency hospitalizations: the share of hospitalizations for emergency indications in the studied group of patients in 2019 was 75.6%. During the COVID-19 pandemic, with restrictions on the provision of primary health care in a planned form, the proportion of emergency hospitalizations increased and reached 83.5% in 2022.

Assessment of the volume of medical care for urinary system diseases in St. Petersburg in 2022 showed that urolithiasis accounted for 16.9% of all cases (Fig. 1).

At the primary health care stage, urolithiasis accounted for only 9.8% of all cases of diseases of the urinary system. Within the framework of emergency medical care, patients with urolithiasis accounted for more than half (62.5%) of cases, which confirms the need to provide medical care for this disease in a significant part of emergency situations, when planned, including preventive measures, were not realized.

Further, such situations also lead to the need to provide significant amounts of specialized medical care: patients with urolithiasis account for 65.2% of cases of specialized hospitalizations in a 24-hour hospital and 30.1% of cases in a daily ward.

DISCUSSION

In the current conditions of primary health care organization, despite the active promotion at the level of federal health authorities of the preventive orientation of the work of medical organizations, it is difficult to detect urolithiasis, especially at the asymptomatic stage, within the framework of mass medical checkups for early detection of chronic non-communicable diseases. This is confirmed by the low level of the indicator "contribution of health check-ups to the detection of urolithiasis", which, despite some growth in recent years, remains insignificant (8.3% in 2022). The insufficient volume of diagnostic tests, which does not allow to diagnose a patient with urolithiasis within the first stage of health check-up, even with a pronounced clinical picture of the disease, can be compensated by additional examinations, which are carried out to the patient in accordance with the established indications at subsequent stages of medical care. With early detection of urolithiasis, patients can be referred in a timely manner for specialized medical care in a planned form, which will avoid urgent situations accompanied by risks to their health. Observance of these principles will provide in the future the possibility of redistributing the volume of medical care provided to patients in favor of less resource-intensive primary health care.

In recent years, there has been a general increase in the activity of medical organizations in conducting medical checkups against the background of the population's readiness to undergo them after the long restrictions in place during the spread of the new coronavirus infection COVID-19. This was accompanied by powerful stimulating actions on the part of health care authorities: the establishment of increased plans to cover the adult population with health check-ups, active information and awareness-raising work with the population on these issues. However, the increase in the volume of medical care within the framework of medical checkups should be carried out without compromising the quality of medical care. From the point of view of urolithiasis in these conditions, a full examination of the patient in accordance with the indications at the second stage of health check-up or subsequent stages of specialized medical care is of particular importance.

In the process of health check-ups of the adult population, patient complaints characteristic of urolithiasis and clinical manifestations of the disease can be identified. The inclusion in this preventive program of examination of men by a urologist and all women of reproductive age by a gynaecologist with appropriate additional examination will make it possible to expect an increase in the level of detection of patients with urolithiasis.

The procedure for medical follow-up of adults [8] determines that persons suffering from certain chronic non-communicable diseases or having a high risk of their development are included in medical follow-up. The

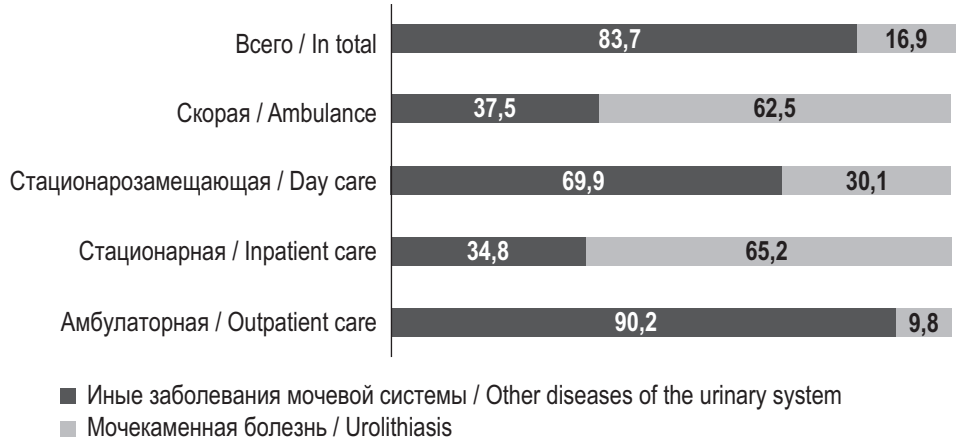

Fig. 1. Distribution of cases of medical care for urolithiasis and other diseases of the urinary system of the adult population of St. Petersburg, 2022 (%)

Рис. 1. Распределение случаев оказания медицинской помощи по поводу мочекаменной болезни и прочих заболеваний мочевой системы взрослого населения Санкт-Петербурга, 2022 год (%)

effectiveness of the organization of medical care should be confirmed by the coverage of patients with medical follow-up in the volume of at least 70% (at least 90% for patients who older than working age). It should be noted that urolithiasis is not listed among the nosological forms detected in the adult population and subject to medical follow-up in accordance with this procedure.

However, according to the "Standard of medical care for adults with urolithiasis (diagnosis, treatment, and medical follow-up)" [14], regardless of the phase of the disease, as part of treatment monitoring, patients should be consulted 3 times a year by the urologist, and, if indicated, by other specialists (nephrologist, cardiologist, rheumatologist, and other specialist physicians). Thus, patients with urolithiasis should be taken under dynamic medical follow-up.

Improvement in recent years of the organization of work of medical institutions providing primary health care to the adult population on preventive measures has had a positive impact on the involvement of patients with urolithiasis in medical follow-up. However, despite the implemented measures, the current level of coverage of patients with urolithiasis by dispensary monitoring cannot be considered satisfactory, as the target value of this indicator, which is at least 70%, has not been achieved.

Attention should be paid to the significant "failure" of the value of the indicator of medical follow-up coverage among people over working age, which was recorded in 2020 (only 12.5% were taken under medical follow-up of those who were required). This indicates insufficient attention to elderly patients during preventive measures during the pandemic of the new coronavirus infection COVID-19, first of all from the primary health care, which did not ensure the achievement of the target value of the indicator in 90%. The identified obvious shortcomings in the organization of preventive measures for patients with urolithiasis in the provision of primary health care should be taken into account in the work of medical organizations.

CONCLUSION

The organization of primary health care in terms of preventive measures for urolithiasis requires systematic improvement.

The possibility of primary detection of urolithiasis during health check-ups is a further basis for expanding the coverage of the population with these preventive measures, compliance with the frequency of their implementation in each particular patient. Special attention should be paid to the quality of medical care provided as part of preventive measures. In view of the limited number of diagnostic tests performed at the first stage of health check-up to diagnose urolithiasis, patients should be referred to the second stage of health check-up and to subsequent stages of medical care as indicated. Close attention should be paid to patients in risk groups, those with an aggravated family history, as well as people of working age, the preservation of whose health is one of the primary medical and social tasks of the health care system in the implementation of the national project "Long and Active Life", starting in 2025.

It is also important to emphasize that medical organizations providing primary health care and responsible for preventive measures should pay attention not only to the active detection of urolithiasis among the population, but also to strict compliance with the requirements for preventive measures among patients diagnosed in previous years. Organization of medical follow-up of patients, based on the norms provided by the Standard of medical care for adults with urolithiasis (diagnosis, treatment and medical follow-up) [12], will allow to prevent in time the development of complications of the disease, emergency conditions, including those requiring surgical intervention, to save the life and health of patients for many years.

Along with this, a separate direction for improving the organization of medical follow-up of patients with urolithiasis should be the establishment by the Ministry of Health of the Russian Federation as a body of federal executive power, which performs the functions of development of state policy and regulatory and legal regulation in the field of health care, of appropriate requirements in regulatory and legal documents governing the provision of medical care for this disease.

It seems that the application of these approaches will create favorable conditions for the implementation of patient-centered measures in the provision of medical care to patients with urolithiasis, minimize the occurrence of emergency situations, redistribute the resources of the health care system, aimed at the treatment

of urolithiasis, in favor of less wasteful primary health care.

ADDITIONAL INFORMATION

Author contribution. Vishnyakov N.I., Klyukovkin K.S., — research concept, editorial board; Mosiychuk O.M., Ivashikin Yu.M. — research concept, collection and processing of materials, analysis of data obtained, writing text; Kochorova L.V. — research concept, analysis of data obtained, writing text; Rotar R.Yu. — writing a text, reviewing the literature. All the authors read and approved the final version of the article before publication.

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ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Вишняков Н.И., Клюковкин К.С. — концепция исследования, редакция; Мосийчук О.М., Ивашикин Ю.М. — концепция исследования, сбор и обработка материалов, анализ полученных данных, написание текста; Кочорова Л.В. — концепция исследования, анализ полученных данных, написание текста; Ротарь Р.Ю. — написание текста, обзор литературы. Все авторы прочли и одобрили финальную версию статьи перед публикацией.

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STRUCTURE OF ACADEMIC MOTIVATION OF FIRST-YEAR MEDICAL UNIVERSITY STUDENTS

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ABSTRACT. Learning in higher education institutions is a process of obtaining specialized knowledge, skills and abilities on the basis of a secondary education. Nowadays the problem of lack of motivation of learners to receive a definite education becomes actual. A large number of works are aimed at finding a system for assessing motivation and tools for adapting the learner to a qualitatively different method of acquiring knowledge, which is characteristic for higher education. It is proved that motivation is connected not only with intelligence, but also with the personal maturity of university entrants. The aim of the study was to analyze the structure of motivation of medical students who are the freshes using a standardized questionnaire of the Wallerand academic motivation scale, adapted by T.O. Gordeeva. The results of the answers of 254 students with an average age of 18.3 years were included in the analysis. Among general population, the average indicators of intrinsic motivation of students were revealed with higher indicators in girls. The analysis of extrinsic and intrinsic motivation, as well as amotivation, fixed lack of interest in the students to the learning process while maintaining motivation to obtain knowledge and form professional competencies. Thus, the dominance of intrinsic motivation parameters allows to make the independent and conscious choice of students in determining the place of study. Insufficient social maturity of 1st year students causes the need for adaptation programs.

KEYWORDS: academic motivation, motivation to learn, medical education

СТРУКТУРА АКАДЕМИЧЕСКОЙ МОТИВАЦИИ ПЕРВОКУРСНИКОВ МЕДИЦИНСКОГО УНИВЕРСИТЕТА

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РЕЗЮМЕ. Обучение в высших учебных заведениях представляет собой процесс получения специальных знаний, умений и навыков на основе имеющегося среднего образования. В настоящее время актуальной становится проблема отсутствия мотивации обучающихся получать образование. Большое количество работ направлено на поиск системы оценки мотивации и инструментов адаптации обучающегося к качественно иному методу получения знаний, которым отличается обучение в вузе. Доказанной является связь мотивации не только с интеллектом, но и с личностной зрелостью абитуриентов. Цель исследования — анализ структуры мотивации студентов, поступивших на первый курс медицинского университета, с помощью анкеты шкалы академической мотивации Валлеранда, адаптированной Т.О. Гордеевой. В анализ включены результаты 254 студентов, средний возраст которых составил 18,3 года. В общей популяции выявлены средние показатели внутренней мотивации обучающихся с более высокими показателями у девушек. Анализ внешней и внутренней мотивации, а также амотивации показал отсутствие интереса у обучающихся к процессу обучения при сохранении мотивации к получению знаний и формированию профессиональных компетенций. Таким образом, доминирование параметров внутренней мотивации позволяет оценить самостоятельный и осознанный выбор студентов при определении места обучения. Недостаточная социальная зрелость студентов 1-го курса определяет необходимость проведения программ адаптации.

КЛЮЧЕВЫЕ СЛОВА: академическая мотивация, мотивация к обучению, медицинское образование

INTRODUCTION

Motivation of any activity, including special education, is a complex, multidimensional structure, which is determined not only by the goal and desires, but also by the search for strategies for implementation, reactions to failures, as well as by the cognitive component [1, 2]. Productive cognitive activity and active learning of the curriculum is a pressing problem among students of various educational institutions [3]. The study of processes, methods, and means of motivating students to educational activity in recent years has been given an important role in understanding modern problems of the learning process and their correction. Many researchers, discussing the desire to get special education, pay attention not so much to intellectual abilities as to the characteristics of motivational variables [4]. At the same time, a direct relationship between intelligence indicators and the motivation to obtain education is logical [4, 5–8]. Motivation is influenced by a large number of factors, including social maturity and comorbidity [9–13]. Validated scales and questionnaires are used for screening determination of leading motives [14, 15]. It is fundamentally important to establish the motives of learning in students studying in the specialties of the category "human-human", including medical [1, 10]. Taking into account the transformation of society with the increase of consumer attitude, including to the process of education, the number of cases of academic "dishonesty" increases [16, 17]. The academic motivation scale has been adapted for medical students [18, 19].

AIM

The aim is to analyze the motivation structure of students who entered the first year of medical university in 2023 using academic motivation scale questionnaire.

MATERIALS AND METHODS

A single-center prospective observational study using a formatted questionnaire was conducted. The questionnaire was conducted anonymously and voluntarily among 1st year students who entered St. Petersburg State Pediatric Medical University in 2023 using the questionnaire "Wallerand Academic Motivation Scale" adapted by T.O. Gordeeva. All study participants

were informed about the need to answer questions truthfully, based on true feelings and sensations. The obtained data were exported to a Microsoft Office Excel spreadsheet and processed using StatTech 4.1.5 statistical package. Quantitative indicators were evaluated for conformity to normal distribution using the Kolmogorov–Smirnov criterion, independent samples were compared using the Mann–Whitney U-criterion. The direction and closeness of correlations between quantitative indicators were evaluated using Spearman rank correlation coefficient, prognostic models were developed using linear regression method. Differences at $p < 0.05$ were considered statistically significant.

The Academic Motivation Scale (AMS) is based on the theory of self-determination by E. Desi and R. Ryan [20, 21]. The questionnaire was developed by R. Vallerand et al. in 1989 and is currently used not only for high school students, but also for junior students of specialized secondary and higher educational institutions of various profiles. The study used a questionnaire consisting of 28 questions with the possibility of answering on a 7-point Likert scale [20, 22]. The average values of answers were calculated by subscale separately and in the total sum of scores. The profile of dominant types of students' academic motivation was determined by analyzing the results of subscale and their totals.

In accordance with the structure of AMS, students' motivation is presented as a combination of intrinsic (autonomous) motivation, aimed at obtaining pleasure, and extrinsic motivation. Intrinsic motivation represents a number of related parameters: cognitive motivation, achievement motivation, and self-development motivation. Cognitive motivation (CM) determines the student's aspiration to search for new knowledge, understanding of the studied material, accompanied by the experience of interest and pleasure in the learning process. Achievement motivation (AM) determines a person's desire to achieve high results in learning activities. Self-development motivation (SDM) determines a person's aspiration to develop inherent abilities and realize potential within the framework of education, to form professional competencies [21, 23]. In this regard, autonomous motivation is defined as the most important component of the guarantee of quality learning, contributing, in the presence of appropriate cognitive properties of personality, to the reduction of academic failure and increase of psychological adaptation to learning [24, 25]. At the same time, it is proved that intrinsic motivation is dynamic and dependent on various social and cultural parameters, including educational parameters [26].

External motivation explains human activity in accordance with specific reasons organized into two groups consisting of two subgroups each. The first group (controlled motivation) includes external and introjected regulation, which help to exert control over external events beyond the individual's action. The second group (sensory motivation) includes identified and integrated regulation, in which a person feels control over his or her actions [23]. In the AMS questionnaire, extrinsic motivation is represented by three subscales: self-esteem motivation, introjected motivation, and externalized motivation. Self-esteem motivation (SEM) assesses the desire to learn in order to increase one's own importance and self-esteem through success in learning. Introjected motivation (IM) assesses the desire to learn under the influence of a sense of duty and shame for unjustified expectations of social institutions. Externalized motivation (EM) is opposite to the idea of personal autonomy and is associated with the desire to learn under the influence of the requirements of society. Amotivation (Am), which is a parameter of the absence of intrinsic and extrinsic motivation and is defined as a decrease in aspirations for purposeful behavior, is separately distinguished [20].

RESULTS AND DISCUSSION

The study included 254 questionnaires from students, of which 53 were males (20.87%). The average age of respondents was 18.3 years. The criterion for inclusion was completion of all fields of the questionnaire while maintaining anonymity. Descriptive statistics of motivation components assessed within the Academic Motivation Scale, depending on the gender of the students are presented in Table 1.

No significant gender differences in intrinsic motivation indicators were found when comparing the results obtained, which may indicate high intrinsic motivation of first-year students to study in medical school. At the same time, the average indicators of the sums

Table 1

Descriptive statistics of quantitative variables according to gender

Таблица 1

Описательная статистика количественных переменных в зависимости от пола

Показатели / Indicators Me [IQR]	Пол / Sex		P
	женский / female	мужской / male	
Возраст (лет) / Age (years)	18,00 [18,00; 18,00]	18,00 [18,00; 18,00]	0,858
Сумма баллов по субшкалам внутренней мотивации / Sum of scores on the subscale of intrinsic motivation	50,00 [43,00; 56,00]	47,00 [43,00; 53,00]	0,120
МП / CM	17,00 [15,00; 19,00]	16,00 [15,00; 19,00]	0,253
МД / AM	15,00 [12,00; 18,00]	15,00 [13,00; 17,00]	0,563
МСР / SDM	18,00 [16,00; 20,00]	16,00 [15,00; 18,00]	0,011
Сумма баллов по субшкалам внешней мотивации / Sum of scores on the subscale of extrinsic motivation	39,00 [34,00; 42,00]	36,00 [30,00; 40,00]	0,003
МСУ / SEM	18,00 [15,00; 20,00]	15,00 [12,00; 17,00]	<0,001
ИМ / IM	15,00 [12,00; 17,00]	14,00 [11,00; 16,00]	0,166
ЭМ / EM	5,00 [4,00; 9,00]	5,00 [4,00; 9,00]	0,510
Ам / Am	13,00 [11,00; 15,00]	12,00 [10,00; 14,00]	0,437

Note: Am — amotivation; IM — introjected motivation; AM — achievement motivation; CM — cognitive motivation; SDM — self-development motivation; SEM — self-esteem motivation; EM — externalized motivation
Примечание: Ам — амотивация; ИМ — интроецированная мотивация; МД — мотивация достижений; МП — мотивация познания; МСР — мотивация саморазвития; МСУ — мотивация самоуважения; ЭМ — экстернальная мотивация.

of scores of the internal motivation block exceed the similar indicators of the external motivation block in both sexes, but without statistical difference, which may indicate the immaturity of students' personality and lack of independence in choosing a profession. A statistically significant difference in the motivation of self-development in girls (p=0.011) may indicate greater awareness in the choice of profession and place of study. M.D. Shamilov and M.V. Noskova obtained similar data with the dominance of intrinsic motivation indicators in studies conducted in other medical universities in Russia [19, 27].

The Mann–Whitney U-criterion revealed statistically significant differences in the sum of scores of external motivation subscale scores depending on gender (p=0.003). Significant differences were also revealed in the group of self-esteem motivation with a significant increase in the mean values of the indicator in girls (p <0.001). The obtained results indicate the desire of girls in training to emphasize their own importance and increase their self-esteem.

Taking into account the high role of intrinsic motivation in the formation of the desire to acquire knowledge and professional competencies, we evaluated the mean values of the subscale. The comparative characteristics of subscale values related to intrinsic motivation of students depending on gender are presented in Table 2.

Table 2

Analysis of intrinsic motivation depending on gender

Таблица 2

Анализ внутренней мотивации в зависимости от пола

Показатели / Indicators	Категории / Categories	Пол / Sex			P
		Me	Q_1–Q_3	N	
МП / CM	Женский / Female	17,00	15,00–19,00	201	0,253
	Мужской / Male	16,00	15,00–19,00	53	
МД / AM	Женский / Female	15,00	12,00–18,00	201	0,563
	Мужской / Male	15,00	13,00–17,00	53	
МСР / SDM	Женский / Female	18,00	16,00–20,00	201	0,011*
	Мужской / Male	16,00	15,00–18,00	53	
Сумма / Sum	Женский / Female	50,00	43,00–56,00	201	0,120
	Мужской / Male	47,00	43,00–53,00	53	

Примечание: МД — мотивация достижений; МП — мотивация познания; МСР — мотивация саморазвития.
Note: AM — achievement motivation; CM — cognitive motivation; SDM — self-development motivation.

Table 3

Summary values of the correlation analysis of the relationships between the subscales of the AMS

Таблица 3

Сводные значения корреляционного анализа взаимосвязей субшкал ШАМ

Параметр / Parameter	Возраст / Age	ПМ / CM	МД / AM	МСР / SDM	МСУ / SEM	ИМ / IM	ЭМ / EM
МП / CM	0,101						
МД / AM	0,135	0,810***					
МСР / SDM	0,079	0,783***	0,761***				
МСУ / SEM	–0,025	0,454***	0,477***	0,629***			
ИМ / IM	–0,038	0,152*	0,071	0,166**	0,453***		
ЭМ / EM	–0,139	–0,493***	–0,397***	–0,409***	–0,136*	0,139*	
Ам / Am	0,082	0,983***	0,797***	0,724***	0,441***	0,155*	0,155*

* p < 0,05.
** p < 0,01.
*** p < 0,001.
Note: Am — amotivation; IM — introjected motivation; AM — achievement motivation; CM — cognitive motivation; SDM — self-development motivation; SEM — self-esteem motivation; EM — externalized motivation.
Примечание: Ам — амотивация; ИМ — интроецированная мотивация; МД — мотивация достижений; МП — мотивация познания; МСР — мотивация саморазвития; МСУ — мотивация самоуважения; ЭМ — экстернальная мотивация.

Despite the increase in the mean scores of girls, no statistically significant differences were found when assessing the sums of internal motivation subscale scores. The demonstrated average scores of each subscale, the leading value of which in respondents of both genders is occupied by the scale of self-development motivation, testify to the desire of students to develop their abilities within the framework of forming professional competencies.

Correlation analysis (Spearman's coefficient) was conducted to assess the interrelationships of the motivation subscale; the summary values are presented in Table 3.

When pairwise assessment of the sum of intrinsic motivation subscale scores with SEM, a significant direct relationship of moderate strength was obtained (ρ=0.558, p <0.001). When comparing measures of the sum of intrinsic motivation subscale scores and EM, a significant inverse relationship of moderate strength was found (ρ=0.461, p <0.001), indicating a predominant desire to acquire knowledge to avoid problems associated with academic failure.

The mean values of the amotivation subscale showed rather low values (13.0 for girls and 12.0 for boys) and did not correlate with each other. At the same time, when pairwise comparing the amotivation subscale with the subscale of intrinsic motivation, correlating values were obtained: with CM (ρ=0.983, p <0.001), AM (ρ=0.797, p <0.001), SDM (ρ=0.724, p <0.001), as well as with the total sum of scores (ρ=0.899, p <0.001). This, along with rather low average values of intrinsic motivation indicators, indicates the lack of interest in the learning process in students while maintaining motivation to acquire knowledge and form professional competencies.

The established direct connection of moderate strength between CM and SEM indicates the desire for self-actualization, increase in self-esteem when acquiring new competencies. At the same time, the established moderate inverse relationship between all subscales of intrinsic motivation and EM may indicate an increased interest in acquiring knowledge regardless of the potential benefits. Thus, the obtained data testify to the students' desire to acquire knowledge in the absence of interest in the process of education.

CONCLUSION

Currently, it is still relevant to determine the leading model of motivation when students enter educational organizations, including medical education institutions. The revealed dominance of intrinsic motivation parameters allows determining the independent and conscious choice of students in determining the path of professional development. Low average indices of internal motivation subscale parameters determine insufficient social maturity of the 1st year students, which requires adaptation programs. Sociological studies that allow assessing students' motivation can be used to

optimize the adaptation program for first-year students.

ADDITIONAL INFORMATION

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

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ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

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

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

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ARCHITECTURE OF SAINT PETERSBURG HOSPITALS: FROM PETROVSKY BAROQUE TO HI-TECH. PART V. MODERN

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ABSTRACT. This article continues the research project on hospital architecture in St. Petersburg from a historical perspective: from Baroque on to High-Tech. The fifth part of the cycle is devoted to the Art Nouveau era, a trend that emerged at the turn of the 19th and 20th centuries as a counterweight to eclecticism. During this period, old artistic forms and techniques were rethought, and various types and genres of art were brought together and merged. The architectural and artistic image of an Art Nouveau building necessarily took into account the functional purpose of the structure — primary attention was paid to the layout of the interior spaces, which in turn influenced the external forms. Architectural structures of this period are distinguished by asymmetry, abundance of fancifully curved lines and shapes, liana-like twists and interweavings. The artistic and architectural-compositional features of the style are considered using the example of the Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties", the Orthopedic Institute, Olga's Shelter for the Sick in Memory of Gregory, the Community of Sisters of Mercy of St. George and the Kronstadt Naval Community of Sisters of Mercy of the Russian Red Cross Society, the St. Petersburg City Hospital for the Mentally Ill in the Name of the Holy Great Martyr and Healer Panteleimon, the A.E. Bari Hospital, Maternity Hospital No. 1, and the Central Hospital of the Post and Telegraph Department. Art Nouveau architecture, which replaced eclecticism, marked the beginning of a new art, creatively transforming the entire history of European art. While using all the architectural innovations of this style, the hospital buildings of St. Petersburg retained classical austerity, but what was most important, they were entirely functional. The Art Nouveau era was reflected not only in the decorative design of buildings, but above all in the functional equipment of hospitals, the competent planning of buildings, and the creation of a more comfortable environment for medical institutions.

KEYWORDS: Saint Petersburg, hospital architecture, modern, Children's City Hospital in memory of the Holy Coronation of Their Imperial Majesties, Orthopedic Institute, Olgas' shelter for the sick in memory of Gregory

АРХИТЕКТУРА БОЛЬНИЦ САНКТ-ПЕТЕРБУРГА: ОТ ПЕТРОВСКОГО БАРОККО К ХАЙ-ТЕКУ. ЧАСТЬ V. МОДЕРН

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РЕЗЮМЕ: Статья продолжает исследовательский проект о больничной архитектуре Санкт-Петербурга в историческом ракурсе: от барокко к хай-теку. Пятая часть цикла посвящена эпохе модерна — направления, которое сформировалось на рубеже XIX–XX вв. в противовес эклектике. В этот период происходило переосмысление старых художественных форм и приемов, сближение и слияние различных видов и жанров искусства. Архитектурно-художественный образ здания стиля модерн обязательно учитывал функциональное назначение строения — первостепенное внимание стало уделяться планировке внутренних помещений, что, в свою очередь, влияло на внешние формы. Архитектурные сооружения этого периода отличают асимметрия, обилие причудливо изогнутых линий и форм, лианообразные извивы и переплетения. Художественные и архитектурно-композиционные особенности стиля рассмотрены на примере Детской городской больницы «В память Священного коронования Их Императорских Величеств», Ортопедического института, Ольгиного приюта для больных в память Григория, Общины сестер милосердия Святого Георгия и Кронштадтской Морской Общины сестер милосердия Российского общества Красного Креста, Петербургской городской больницы для душевнобольных во имя святого великомученика и целителя Пантелеймона, лечебницы А.Э. Бари, родильного дома № 1, центральной больницы Почтово-телеграфного ведомства. Архитектура модерна, пришедшая на смену эклектике, стала творческим переосмыслением всей истории европейского искусства и ознаменовала собой начало искусства нового. При использовании всех архитектурных новшеств этого стиля больничные здания Петербурга сохраняли классическую строгость, но главное — были максимально функциональными. Эпоха модерна нашла отражение не только в декоративном оформлении зданий, но, прежде всего, в оснащении, грамотной планировке, создании более комфортной среды лечебных учреждений.

КЛЮЧЕВЫЕ СЛОВА: Санкт-Петербург, больничная архитектура, модерн, Детская городская больница «В память Священного коронования Их Императорских Величеств», Ортопедический институт, Ольгин приют для больных в память Григория

Modern style (French moderne from the Latin modernus — new, contemporary) emerged at the turn of the XIX–XX centuries, significantly displacing retrospective stylization [1–4][1]. The main focus of this period was a desire of artists and architects to contrast their work with the eclecticism and historicism of the second half of the XIX century. Art Nouveau is characterized by a free layout that meets the functions of buildings, the use of new construction and finishing materials such as metal, reinforced concrete, glass, facing brick. This period saw a rethinking of old artistic forms and techniques. Architectural buildings of this time are characterized by asymmetrical volumes, which were created using oriel windows, towers, balconies, an abundance of intricately curved lines and shapes, flowing silhouettes, liana-like twists and weaves, emphasized decorativeness, the use of mosaics, majolica, stained glass as decorations, the predominance of pastel muted shades in the color scheme [5–7].

An example of a medical institution built in the Art Nouveau style is the St. Petersburg City Children's Hospital "In Memory of the Holy Coronation of Their Imperial Majesties" (2 Litovskaya Street). By the end of the XIX century, the high incidence of infectious diseases among

[1] This article continues a series of articles on hospital architecture in St. Petersburg that were published in previous editions of the journal Medicine and Health Care Organization [1–4].

children and the limited number of places for hospitalization led to the insufficiency of three children's hospitals in St. Petersburg[1]. In 1896, the City Duma decided to open a new children's hospital, scheduling its establishment to coincide with the upcoming day of the Holy Coronation of Their Imperial Majesties. The beginning of construction was preceded by the need to develop a project and select a location for the hospital. To solve these issues, a Preparatory Commission was established, consisting of members of the city government, renowned scientists and pediatric practitioners[2].

A pavilion type of hospital was considered to be the most appropriate when the project was developed, thus, it became the basis for the project. The famous Art Nouveau architect P.Y. Suzor (1844–1919) presented sketches of various types of children's hospitals; the outstanding pediatrician, the author of the project of children's hospitals of Prince P.G. Oldenburgsky in St. Petersburg and St. Vladimir's in Moscow (pavilion type) K.A. Raukhfus (1835–1915) outlined requirements for building arrangement in accordance with their tasks. The hospital project was drawn up by architect M.I. Kitner (1868–1942), who later supervised the construction.

On August 23, 1901 the works started, and on September 22 the hospital was laid down. A plot of 15,497 square sazhens (a Russian unit of length equal to approx. 7 feet) was set aside for construction. In 1903 the buildings were finished in a rough form. In 1904 the premises were finished, equipment and inventory were imported: various medical devices, furniture, linen and dishes. The hospital was opened on May 25, 1905.

According to the pavilion system, the hospital consisted of 18 separate buildings (Fig. 1). Putilov rubble slab was used for the foundations, the walls were brick, and concrete ceilings were reinforced with iron beams [9]. The appearance of the hospital complex was characterized by laconism (Fig. 2). The building facade is covered with smooth plaster, decorative details are laid with red face brick: horizontal and vertical belts with dentils in corner parts of the buildings; round medallions in the gable[3], archivolt[4] with dentils, gauged arches of windows, lintels of window openings, highlighted with bricks, including those with styled keystone. The buildings are completed with an iron pitched roof with wide overhangs with wooden purlins on wooden rafter tails[5] (Fig. 3).

Oak floors were made in wards, and the rest of the rooms were covered with mettlach tiles. The hospital's chief physician D.A. Sokolov (1861–1915) decided to decorate the hospital by placing paintings by prominent artists that were understandable and interesting to children, the permanent residents of the hospital, and would also speak to the heart of their parents. Some of these pictures were painted on linoleum or porcelain tiles for easier washing and disinfecting. Most of the paintings were ordered from the Society for the Encouragement of Artists. Reproductions of paintings by G. Hoffman "Healing of the Sick" were placed at the entrance and "Blessing of Children" were placed in the hall of the outpatient clinic. The infectious pavilions were decorated with "Mother of God" by V.A. Bouguereau and "Christ in the Garden of Gethsemane" by G. Hoffman, the corridor of the diphtheria department was decorated with "Christ with Sheep" by G.P. Parker, and the hall for children's games was designed with "The Nativity of Christ" by J.K. Stieler. D.A. Sokolov himself made a sketch for the chapel — "Christ, scattering flowers to meet the souls of children who have left the earth". The only surviving painting is a copy of V.A. Bouguereau's work "The Virgin and Angels" found in a niche in the wall of the preoperative room of the surgical department during the renovation of the mid-1980s (Fig. 4) [10].

The buildings were subdivided into three groups: non-infectious and infectious departments, household

[1] In 1834, the Nicholas Children's Hospital was opened in St. Petersburg; in 1844, the Elizabeth Clinical Hospital for Young Children was established; and in 1869, the Prince P.G. Oldenburgsky Children's Hospital was opened.

[2] In the early 1900s the commission was transformed into the Construction Commission. New members were admitted: P.I. Lelyanov (head of the city government) was appointed as chairman, V.A. Troinitsky, M.A. Anichkov, V.S. Petrov, M.P.Botkin — as members of the Board, M.P. Botkin — as a chairman of the Hospital Commission, A.N.Oppenheim — as a chairman of the Sanitary Commission, V.A. Aleksandrov — as a councillor of the City Duma. K.A. Raukhfus and I.P. Korovin were invited as pediatricians in ordinary; S.V. Posadsky, N.I. Chernyaev, V.N. Reitz, L.I. Tomashevsky and, in the last year of construction, Prof. D.A. Sokolov were appointed as chief physicians of the hospital under construction.

[3] Gable — a double sloping top of the wall, passing without projections into its main plane.

[4] Archivolt — relief edging of the arch bending along its edge.

[5] Rafter tail is a roof framing element that serves to extend the rafters and form an eave.

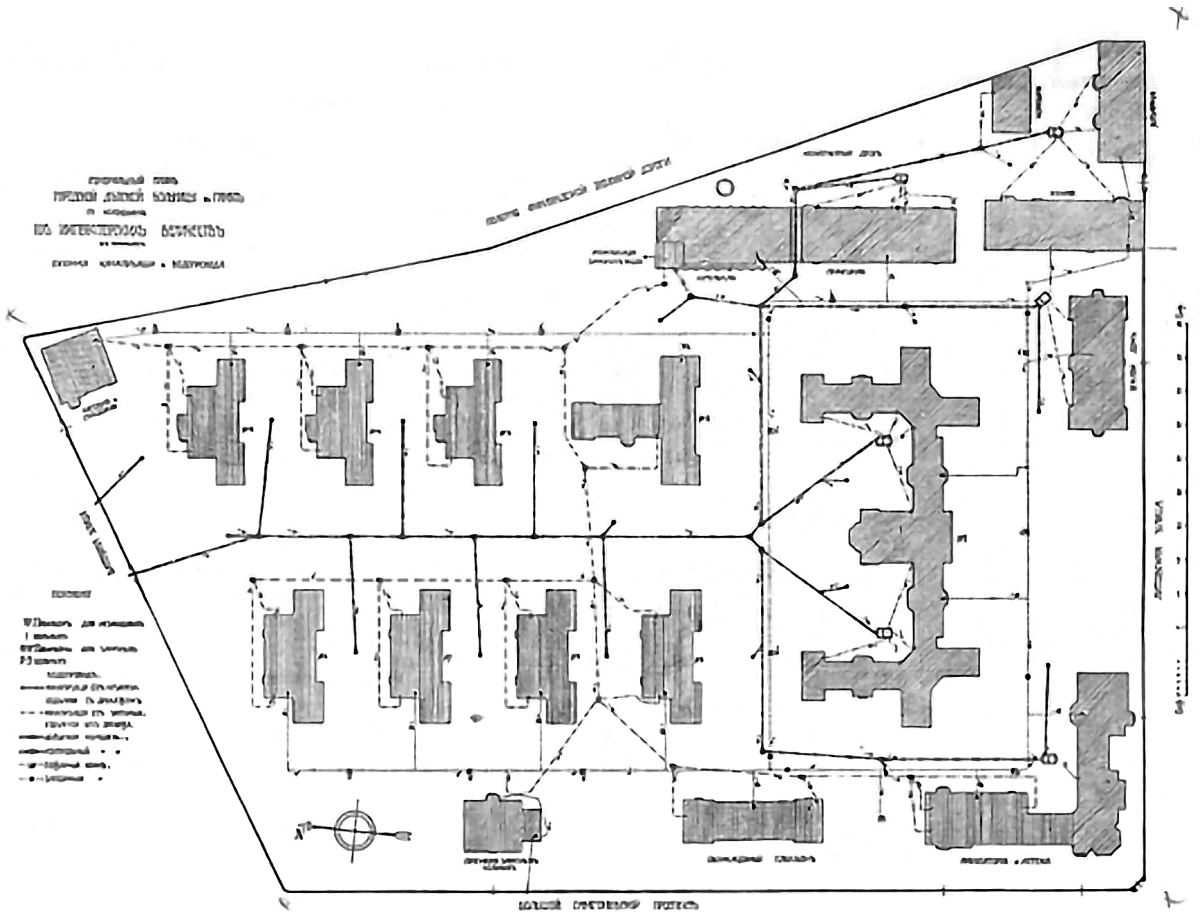

Fig. 1. General plan of the Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties"

Рис. 1. Генеральный план детской городской больницы «В память Священного коронования Их Императорских Величеств» [8]

Fig. 2. View of the Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties"

Рис. 2. Вид детской городской больницы «В память Священного коронования Их Императорских Величеств»[1]

[1] Photo from the collection of the museum of the St. Petersburg State Pediatric Medical University.

Fig. 3. Decorative elements on the façade of the main building of the Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties". Photo V.I. Makeeva

Рис. 3. Декоративные элементы на фасаде главного здания детской городской больницы «В память Священного коронования Их Императорских Величеств». Фото: В.И. Макеева

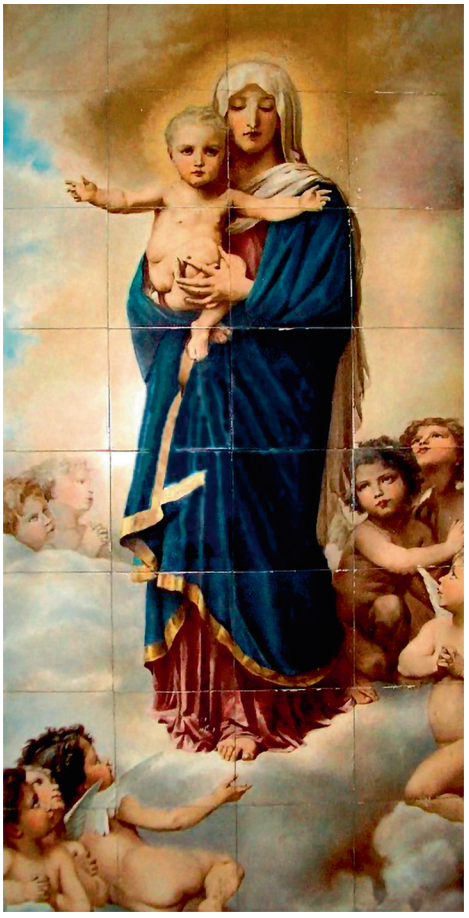

Fig. 4. Copy of V.A. Bouguereau's painting "Our Lady of Angels" in the pre-operative room of the surgical department [10]

Рис. 4. Копия картины В.А. Бугро «Богородица и ангелы» в предоперационной хирургического отделения [10]

Fig. 5. Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties". Entrance to the outpatient clinic building with a pharmacy, emergency room and hospital office

Рис. 5. Детская городская больница «В память Священного коронования Их Императорских Величеств». Вход в здание амбулатории с аптекой, приемным покоем и конторой больницы[1]

[1] Photo from the collection of the museum of the St. Petersburg State Pediatric Medical University.

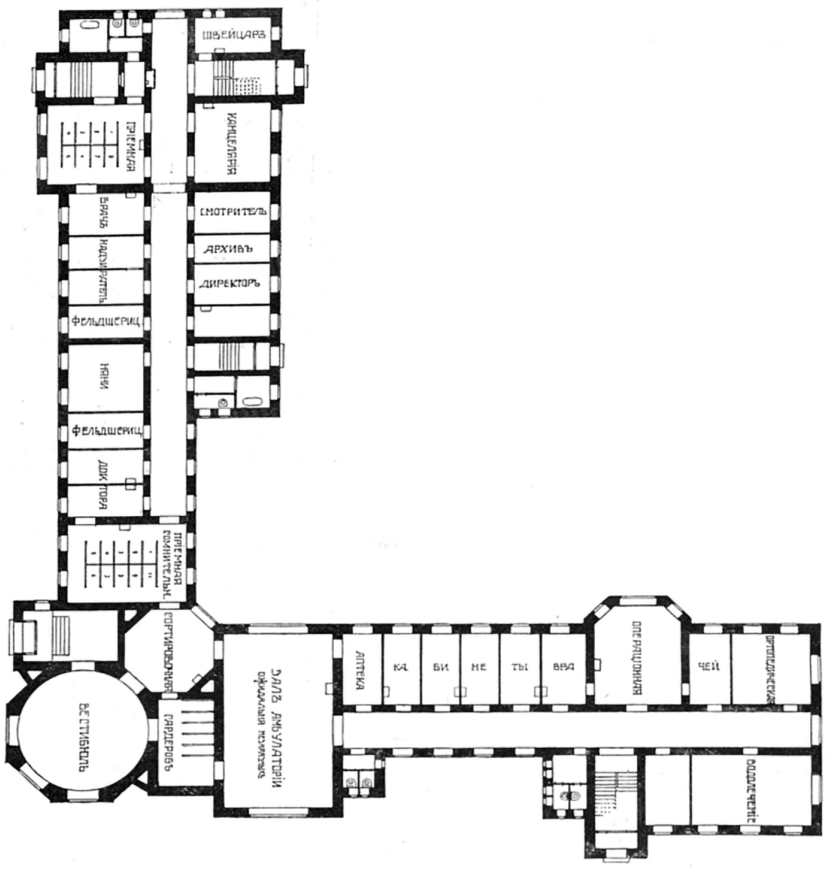

Fig. 6. Outpatient clinic building with a pharmacy, emergency room and hospital office. Plan of the first floor [8]

Рис. 6. Здание амбулатории с аптекой, приемным покоем и конторой больницы. План первого этажа [8]

buildings. The non-infectious group included: an outpatient clinic, a pharmacy, a reception department, a main building for non-infectious diseases with 120 beds, and a dwelling house for doctors. The outpatient clinic (Fig. 5) had a special sorting room where the doctor performed preliminary examinations. In order to avoid infection while waiting for an appointment, non-communicable visitors were directed to a common room, while those causing concern went to a special reception room with a separate entrance (Fig. 6). The general hall had seven rooms where specialized physicians received patients, as well as an operating room, an orthopedic room, and a hydrotherapy room. On the second floor there was a pharmacy.

The main non-contagious building was two stories high and included surgical and therapeutic departments (Fig. 7). In order to increase the time that children spent in the air, open verandas were placed on the first floor of the building, and covered balconies were placed on the second floor. The balconies faced south and were protected from the wind from the north (Fig. 8). It was possible to go directly to the garden from an open veranda. The central part of the building had a one- floor extension, which housed an operating room with a dressing room, an instrument room, and a sterilization room. The medical staff was accommodated in its own three-storey house. The first floor was occupied by a caretaker, a pharmacist, and two assistants; the second floor was used by the chief physician and a laboratory technician; the third floor was occupied by two physicians and a paramedic. A four-story[1] barracks building was arranged for the lower service personnel of non-communicable wards.

Ten buildings for 280 beds made up the group of the infectious department. The buildings were erected at a distance of 10 fathoms from each other, they were separated from the other buildings by a fence. Wards in the pavilions faced south. Four pavilions had two floors and were intended for the main contagious diseases: measles, smallpox, scarlet fever, diphtheria. Four pavilions with 22 beds each were allocated for mixed forms (Fig. 9). Interestingly, the

[1] The two-floor extension was carried out in 1908–1909.

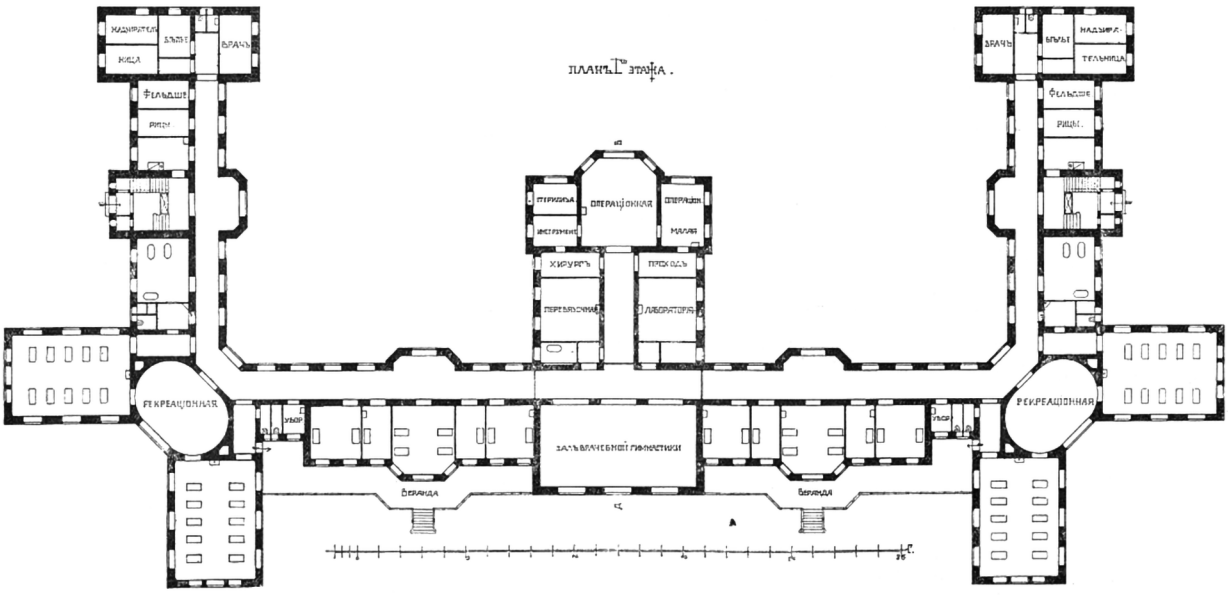

Fig. 7. Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties". Pavilion for 120 beds for non-infectious patients. Plan of the first floor [8]

Рис. 7. Детская городская больница «В память Священного коронования Их Императорских Величеств». Павильон на 120 кроватей для незаразных больных. План первого этажа [8]

Fig. 8. Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties". Open veranda of the pavilion for non-infectious patients

Рис. 8. Детская городская больница «В память Священного коронования Их Императорских Величеств». Открытая веранда павильона для незаразных больных[1]

[1] Photo from the collection of the museum of the St. Petersburg State Pediatric Medical University.

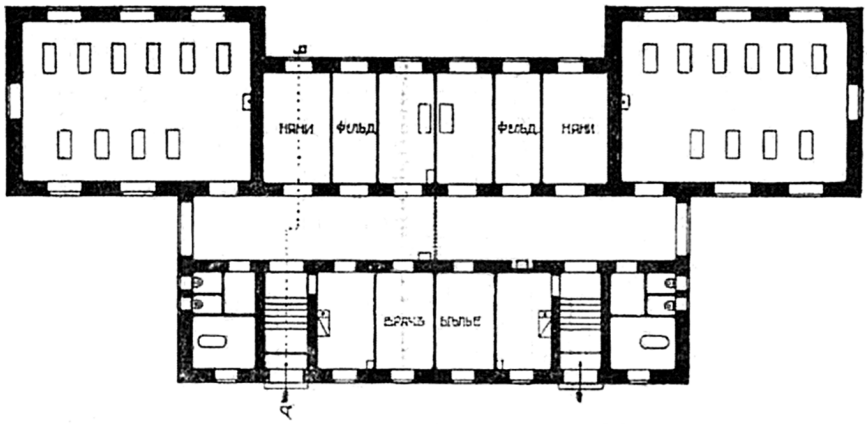

Fig. 9. Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties". Plan of the pavilion for 22 beds [11]

Рис. 9. Детская городская больница «В память Священного коронования Их Императорских Величеств». План павильона на 22 кровати [11]

Fig. 10. Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties". Plan of the observation pavilion for 18 beds [11]

Рис. 10. Детская городская больница «В память Священного коронования Их Императорских Величеств». План обсервационного павильона на 18 кроватей [11]

Fig. 11. Children's City Hospital "In Memory of the Sacred Coronation of Their Imperial Majesties". Isolation department

Рис. 11. Детская городская больница «В память Священного коронования Их Императорских Величеств». Изоляционное отделение[1]

[1] Photo from the collection of the museum of the St. Petersburg State Pediatric Medical University.

pavilions had two entrances and could be divided into two independent halves by existing partitions in case of the need to isolate combined infections.

The admission of obviously contagious patients was well organized. Sanitary carriages were to bring children to a separate building at the infectious department. Assistant physicians were housed on the second floor of this building to prevent infection from spreading from one building to another. Accommodations for nannies and paramedics who provided direct care for the sick were also provided in the pavilions where they directly worked. In 1908–1909, a three-storey stone barracks building was constructed for employees of the infectious department. The barracks was located on the part of the hospital site behind the Finnish railroad track. The number of permanent hospital staff amounted to 250 people.

The most remote part of the hospital site was chosen for a funeral parlor with an autopsy room and a chapel. A laboratory and a servants' room were placed nearby.

A one-story building with two entrances — the observatory pavilion — was located next door to the outpatient clinic. The premise was divided into eighteen wards, each with one bed (Fig. 10). The wards were separated from a corridor by glass partitions for convenient control by the medical staff. The same partitions between the wards gave patients an opportunity to observe life in the pavilion (Fig. 11). The purpose of the pavilion was to temporarily house children whose illness was not determined during admission.

The hospital included a whole group of household premises: a kitchen, laundry with disinfection chamber, boiler room, electrical station, sewage sterilization room, barracks for lower service personnel, stables, barns, and an icehouse.

The hospital kitchen was located in the kitchen wing in the center of the first floor. There was a separate room for washing dishes and cleaning vegetables, as well as a bakery and a milk pasteurization room. On the first floor there was also a kitchen and a canteen for the staff. The second floor was allocated for the accommodation of servants. There were castellanesses, housekeepers, housekeepers' assistants, laundresses and all kitchen staff.

The work of the laundry was organized in an interesting way, which was able to wash 1600 kilograms of linen per day. Contagious linen was soaked, disinfected and fed into a common laundry room equipped with three washing machines and three centrifuges for wringing linen. The laundry room was equipped with an elevator that took the laundry up to the second floor to the ironing room and down to the linen storage room.

All pavilions were heated by low-pressure steam and water heating. A steam line, laid in a separate tunnel, was connected to all buildings. Automatic pumps pumped condensation water back to the boilers. Two cisterns placed underground stored oil residue as fuel. The hospital rooms were mechanically ventilated. Electric fans pumped heated and humidified air into the rooms and sucked out the spoiled air. Instead of the standard 3 cubic centimeters of air per patient of the time, the new hospital was designed to use 5.13 cubic centimeters per bed.

In the course of the planning of the hospital complex, a place was identified for the construction of a hospital church to enable the numerous service personnel to fulfill their Christian duties without being away from their service for long periods of time. In the spring of 1905, on behalf of the St. Petersburg City Administration, the Imperial St. Petersburg Society of Architects announced a competition for the design of a stone single-altar church in Byzantine style with a capacity of 300 people [12]. Out of nine projects submitted to the competition, the first prize of 500 rubles was awarded to the project of Professor of Architecture A.N. Pomerantsev (1849–1918) under the motto "Triangle in a circle", made in the spirit of Athenian churches [13, 14]. However, this project was not realized because there was not enough money for its construction. By the opening of the hospital was built and consecrated only a temporary chapel at the intersection of Batenina Street (now Alexander Matrosov Street) and the Finnish Railroad (Fig. 12). The construction of the hospital church began only in 1908–1909 under the direction of architect A.K. Pavlovsky (1861–1923). The church was located on the second floor of the existing chapel, it was divided into two isolated rooms — for contagious and noncontagious patients. A special building for waiting relatives was attached to the lower floor. In 1910 the church was consecrated in honor of the heavenly patrons of the royal couple — St. Nicholas the Wonderworker and the Holy Martyr Tsarina Alexandra. In 1922 the church was closed, church valuables were taken away. The building was used for some time as a laboratory, then it was demolished, and in 1933 on the site of the temple began construction of the anatomical building. The modern temple, bearing the name

Fig. 12. Chapel at the city children's hospital "In Memory of the Sacred Coronation of Their Imperial Majesties"

Рис. 12. Часовня при городской детской больнице «В память Священного коронования Их Императорских Величеств»[1]

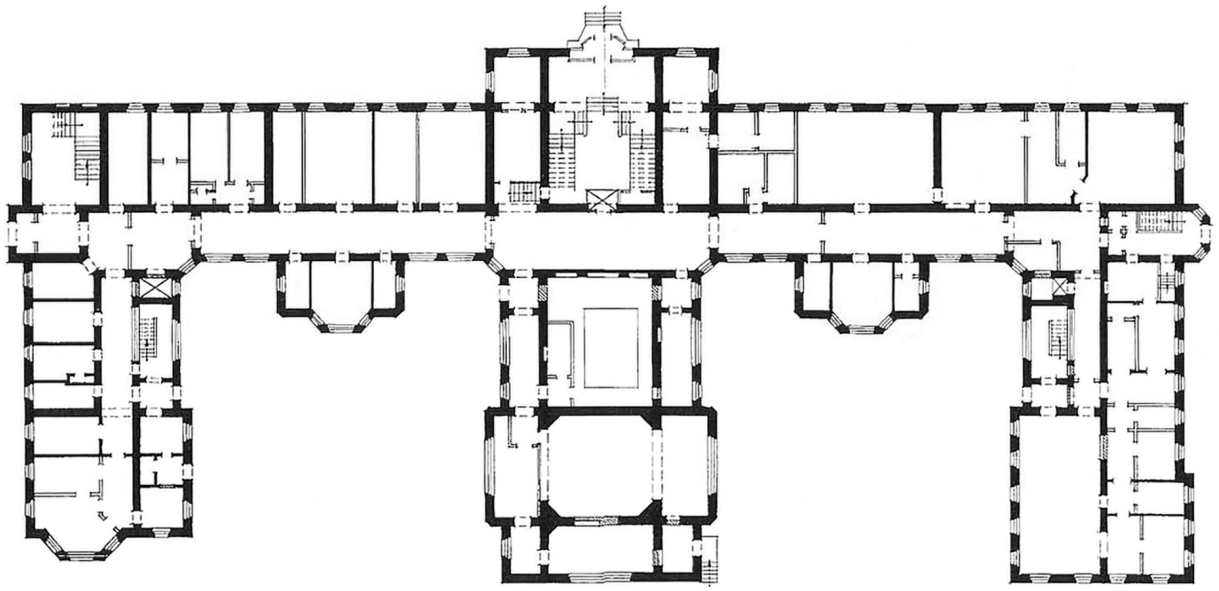

Fig. 13. Saint Petersburg Orthopedic Clinical Institute. Plan of the first floor

Рис. 13. Санкт-Петербургский ортопедический клинический институт. План первого этажа [19]

of the Holy Passion-Bearers Tsar Nicholas and Tsarina Alexandra, is its successor and is located in the premises of the former outpatient clinic and emergency room.

In 1925, on the basis of the hospital was opened the Scientific and Practical Institute of Maternal and Infant Health Care, on the basis of which in 1932 appeared the educational institution "Hospital — Medical university", since 1935 — the Leningrad Pediatric Medical Institute, currently — St. Petersburg State Pediatric Medical University [8, 11, 15, 16].

[1] Photo from the collection of the museum of the St. Petersburg State Pediatric Medical University.

An example of the rationalist version of the modern is the building of the Orthopedic Clinical Institute (Alexandrovsky Park, 5). The construction of the orthopedic clinic was started by order of Empress Alexandra Fyodorovna (1872–1918)[1]. The program of the building construction was developed by orthopedic doctor K.H. Horn (1851–1905), the project was designed by architect R.-F. Melzer (1860–1943). The City Duma donated an extensive plot of land in the Alexander Park for the construction. In 1902 the magazine "Zodchiy" reported on the successful progress of works — it was expected that the building would be put under the roof and finished in the fall, during the winter the interior finishing of the building would be completed, so that it would be possible to finish the construction of the hospital in the summer of 1903 [18]. The beginning of the Russian-Japanese war prevented the completion of the project within these terms. The consecration of the Orthopedic Institute building took place on August 8, 1906.

The building is three-storeyed, W-shaped in plan (Fig. 13). The plinth is finished with gray Serdobol granite, the facade is completely faced with light glazed bricks imported from Germany. The apertures of high windows are emphasized by lighter color of stone and decorated with beam lintels using yellow and green bricks. The facade of the central part of the building, where the church was built, is decorated with a majolica image of the Mother of God with a child, created after the original by the artist K.S. Petrov-Vodkin (Fig. 14). Initially, with the approval of R.-F. Melzer it was planned to install a panel with the image of St. Tsarina Alexandra in honor of the Empress. But the Emperor and Empress recognized this as unnecessary, recommending that the project be replaced by an image of the Mother of God. The five-meter panel, made at the Royal Doulton ceramic factory in London in the summer of 1904, was the artist's first grandiose work [20].

[1] Alexandra Fyodorovna suffered from sacro-lumbar pain from a young age. Her attending physician since 1896 was the orthopedic surgeon K.H. Horn, who had been the head of the orthopedic department of the Maximilianov Hospital since 1894 and who also had his own orthopedic hospital (Fontanka Embankment, 83). The doctor was recommended to the Empress by her German doctors. During treatment procedures, Alexandra Feodorovna and Karl Khristianovich discussed "orthopedic topics". K.H. Horn familiarized the Empress with the statistics of various diseases, mentioning that children also suffer from orthopedic diseases. Since Alexandra Feodorovna had always been close to children's problems, she agreed with the proposal of her attending physician to open a state orthopedic hospital [17].

Fig. 14. The Virgin Mary with Child. Ceramic panel by K.S. Petrov-Vodkin on the building of the Orthopedic Institute

Рис. 14. Богоматерь с младенцем. Керамическое панно К.С. Петрова-Водкина на здании Ортопедического института

The building has oak vestibules, metal balconies and bindings, iron umbrellas and balcony grilles; the floors and the lower parts of the walls in some rooms are finished with metlacha tiles. Much attention was paid to the issue of lighting, which was of great importance for the buildings of dusky northern St. Petersburg. The main rooms of the hospital were oriented towards the sunny side, while the corridors, where lighting does not play a decisive role, were oriented towards the shadow side. The operating room of the left wing received volumetric glazing. Solid glazing was used for the stairwells of the side wings of the building. Ten-meter rectangular openings, covered with metal beams, looked truly gigantic in the eyes of others.

The building of the Institute was located in the middle of a large courtyard, surrounded by a high fence, and represented three interconnected buildings, in the middle of which was arranged a small church of Christ the Healer (Fig. 15). According to the plan of K.H. Horn, the entire free territory was turned into a garden. At the Empress's insistence, a vegetable garden with vegetable beds was built in the garden.

On the first floor there was a library, mechanical, blacksmith, sewing workshops with electric machines

Fig. 15. Saint Petersburg Orthopedic Clinical Institute [21]

Рис. 15. Санкт-Петербургский ортопедический клинический институт [21]

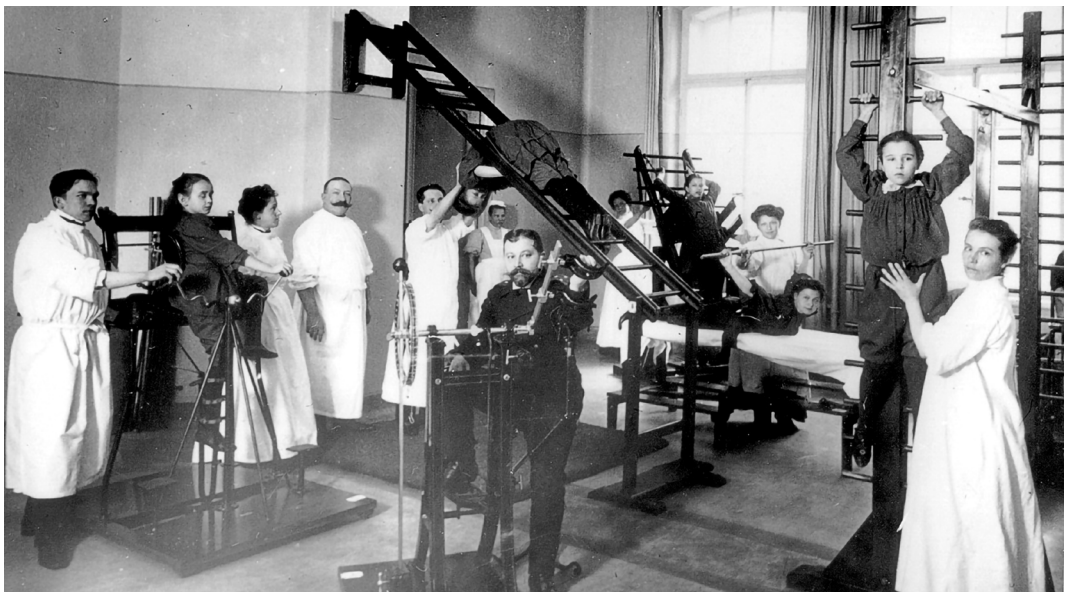

Fig. 16. Gymnasium of the Orthopedic Institute [22]

Рис. 16. Гимнастический зал Ортопедического института [22]

for making prostheses, a dormitory for nurses, a dining room for servants, closets for storing patients' clothes, and a kitchen with a special room for sterilizing dishes. On the second floor there was a reception room for patients, where they passed to outpatient and dressing rooms, a room for making plaster casts, an X-ray room, apartments for the director of the institute and assistants, a gymnasium with devices for physical treatment of different kinds of patients: curvature of the back, cervical vertebrae, leg and arm joints, etc. (Fig. 16).The third floor housed an inpatient ward with 40 beds (the number could be increased). One side of the corridor housed paid patients and the other side housed free patients. Their rooms did not differ in any way and had absolutely identical furnishings. There were also an operating room, an X-ray room, service rooms, baths, a common dining room, a lounge for resting

and reading. In summer patients could use a large well-furnished balcony.

The organization of catering deserves attention. Food was served in a common dining room, located on the third floor, with the help of a lifting machine. Iron cabinets heated by steam were installed in the corridors of the second and third floors to keep the food cold. Movable tables were created and attached to the beds for patients who could not get up.

A mechanical laundry, power house and living quarters for employees, a disinfection chamber and a sectional room were housed in buildings of unplastered brick. The main building and the two service wings were connected by an underground passage.

The Orthopedic Institute accepted patients in need of orthopedic treatment: patients with congenital abnormalities of the musculoskeletal system, tuberculosis of the bones, paralysis and injuries of different parts of the body. Patients were admitted free of charge and for a fee: 30–50 rubles per month for a stay in a general ward for 3–6 people and 80–120 rubles — in a separate room. It was stipulated that the fee was charged mainly not for the maintenance of the institute, but for the manufacture of expensive devices for the poor [23, 24]. The Institute was annually allocated 112 thousand rubles from the Ministry of Internal Affairs, since it was assigned to the Ministry [25]. The construction was carried out on generous donations of Empress Alexandra Fyodorovna, subsidies of the Ministry of Internal Affairs, and together with the complete equipment cost 1 million rubles. The press emphasized that the layout and technical equipment of the institute corresponded to the latest scientific achievements of the time [26]. Doctor of Surgery, Professor R.R. Vreden (1867–1934) was appointed director instead of K.H. Horn, who passed away in 1905.

The building currently houses the North-West branch of the Russian State University of Justice[1].

An example of northern Art Nouveau is the building of the Community of the Sisters of Charity of St. George (Mozhaisky settlement, 25th October Avenue, 105). A tower with a high hipped roof in the center of the stone two-storey building makes it look like a fairy-tale castle (Fig. 17). The plinth is faced with stone, walls are covered with textured plaster and faced with brick, wooden decorations of the pediment and tower refer to images of timber framing architecture[2]. Corners of the building, entrance and window apertures are decorated with rustication[3]. A sign in the semi-circular niche of the pediment indicates that the building belongs to the Red Cross Society. Crosses can also be seen on the chimneys.

In 1899, the Sisters of Charity of St. George began collecting donations for the construction of a cancer hospital for poor people on the outskirts of Duderhof[4]. Barracks for cancer patients were built in memory of the Mother Superior of the Community E.P. Kartseva (1823–1898)[5] in 1900–1902 according to the project of architect G.I. Lyutsedarsky (1870–1946). The center of the first floor housed a reception hall with windows on both sides. Right side of the first floor was allocated for women's department, left side was assigned for men's department. The building was designed for 30 beds. Wards differed in various capacities — for one or two and several beds — and were characterized by high ceilings, plenty of light and air. The walls and all the hospital furniture were white in color. A dressing room was located at the end of the corridor; the upper floor was intended for the sisters' dormitory.

[1] In 1918 the Orthopedic Institute was transferred to the People's Commissariat of Education as an educational and medical institution. In January 1924 it was merged with the Physio-Surgical Institute opened in 1917 to form the State Traumatologic Institute. In 1952 it received a new name — Research Institute of Traumatology and Orthopedics, in 1967 the Institute was named after its first director R.R. Vreden. In 1988 the Institute moved to a new building on Akademika Baikov Street, and since 1995 the historical building has housed the St. Petersburg Medical Academy of Post-Diploma Education and Medical and Social Management. Since 2003 the Tax Academy was located here, and from 2009 the North-West Branch of the Russian Academy of Justice, College of the Russian Academy of Justice was situated here.

[2] Timber framing — or "post-and-beam" construction — a framework of walls consisting of vertical, horizontal and inclined beams, the gaps between which are filled with clay, stone, brick.

[3] Rustication — a recurring element of rockwork — a decorative processing of a wall surface, resembling a masonry of large stones in the form of horizontal strips of equal width, protruding in relief above the background.

[4] Dudergof is a historical district of Krasnoye Selo in the Krasnoselsky District of St. Petersburg, located on the eastern shore of Lake Dudergof.

[5] Elizaveta Petrovna Kartseva — one of the first Russian nurses of mercy and organizers of nursing in Russia. She participated in the Crimean (1853–1856), Serbian-Turkish (1875–1877) and Russian-Turkish (1877–1878) wars. In 1860–1867 she headed the Community of Sisters of Mercy of the Holy Cross, and from 1870 she chaired the Community of Sisters of Mercy of St. George of the Russian Red Cross Society until her death in 1898.

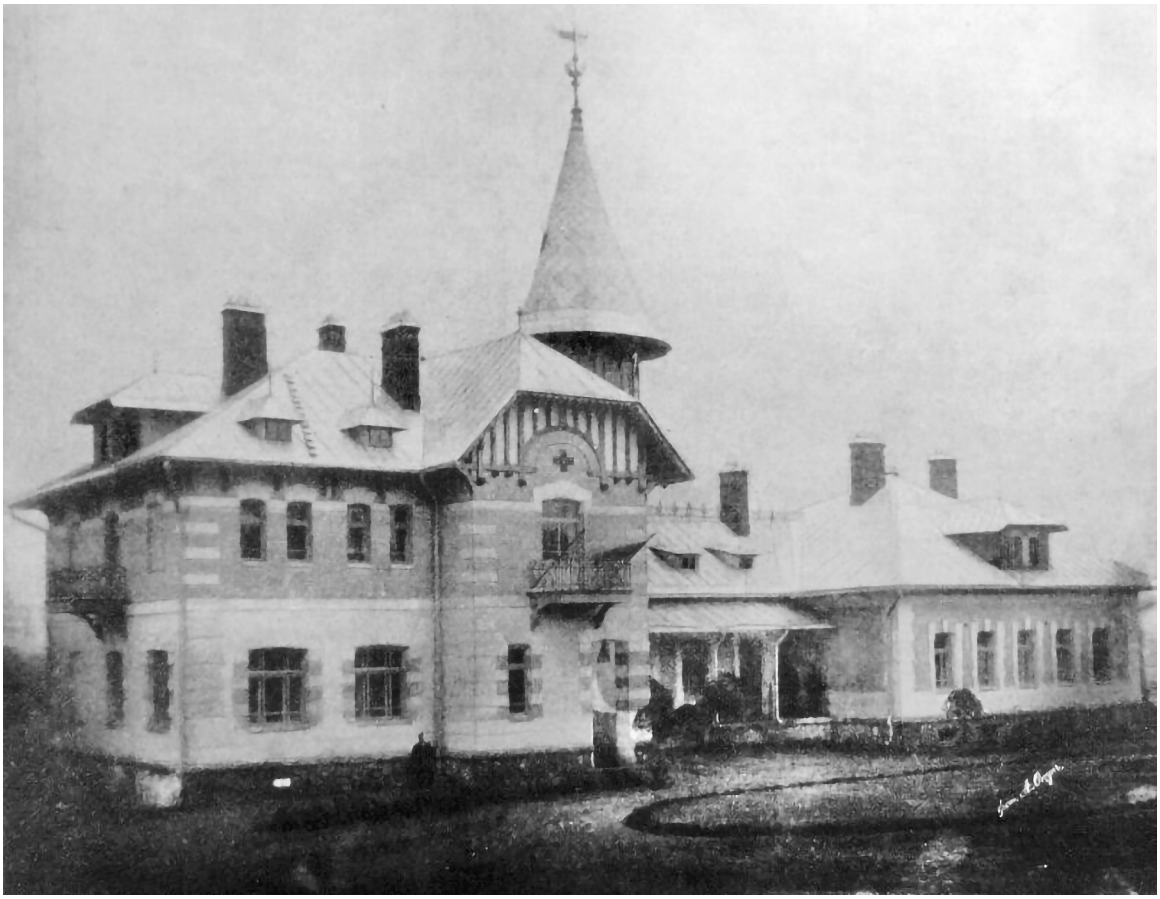

Fig. 17. Building of the hospital of the Community of Sisters of Mercy of St. George in Duderhof. 1902. Photo: A. Otsup

Рис. 17. Здание больницы Общины сестер милосердия Святого Георгия в Дудергофе. 1902 г. Фото: А. Оцуп [22]

Fig. 18. Building of the hospital of the Community of Sisters of Mercy of St. George in Duderhof. Modern view [22]

Рис. 18. Здание больницы Общины сестер милосердия Святого Георгия в Дудергофе. Современный вид [22]

Fig. 19. Women's boarding house of the Saint Petersburg City Hospital for the Mentally Ill in the name of the Holy Great Martyr and Healer Panteleimon [22]

Рис. 19. Женский пансионный корпус Петербургской городской больницы для душевнобольных во имя святого великомученика и целителя Пантелеймона [22]

The barracks for the sick, built by the trusteeship of the Community of the Sisters of Charity of St. George, was solemnly consecrated in memory of the late Sister Superior E.P. Kartseva on August 2, 1902 in the presence of Empress Maria Fyodorovna (1847–1928) [27, 28]. The hospital worked until 1914. After that the building housed a children's orphanage, Finnish and Soviet schools, children's sanatorium for patients with bone tuberculosis. Since 1979 the building has been occupied by a skiing base of the Krasnoselsky district children's and youth sports school (Fig. 18).

The master of Northern Art Nouveau architect G.I. Lyutseradsky also built buildings for the St. Petersburg City Hospital for the mentally ill in the name of the Holy Great Martyr Healer Panteleimon (36 Fermskoye Shosse)[1].

In 1900, a boarding[2] house for women was erected (Fig. 19). The first floor housed 22 restless patients, the second floor housed 28 calm patients, and the third floor housed warders and servants. The storey division is emphasized by the different design of window openings and the combination of textures of finishing materials and colors: red brick, gray stone, and light plaster imitating rustication. The windows of the first floor are completely framed with alternating brickwork and plaster. The windows of the second floor are decorated with a brick beam lintel with plastered imitation of castle stone. The contrasts of color disappear at the level of the third floor — the windows are decorated with shaped protrusions under the window sills.

In 1904, according to the assignment made by the chief physician of the hospital A.V. Timofeev (1861–1925), two stone two-storied buildings were built: men's and women's ones, also called "officers'" and "maid of honor" (Fig. 20, 21). They were intended for troubled patients and were designed for 50 beds each. Basements housed ammosov stoves for air heating, the first floors were occupied by rooms for the sick, the second floors were intended for the staff. The wards of the main room for the sick were separated by a wide corridor from four isolation rooms, which could accommodate one particularly restless patient each. These "isolation rooms" had strong doors with a peephole for observation, and instead of beds they had mattresses on the floor. The window frames in the wards were steel, with ship's glass that could not be broken with a fist, the doors were strong oak, and the main wards had doorways only [29, 30].

The building of A.E. Bari's hospital is an interesting combination of Art Nouveau and brick style (Fig. 22). In 1884, Dr. A.Y. Frey (1847–1899) bought a plot of house No. 60 on

[1] The St. Petersburg City Hospital for the Mentally Ill was opened in the name of St. Panteleimon the Great Martyr and Healer in 1885 next to Emperor Alexander III's House of Care for the Mentally Ill. In 1919 they were merged into the Udelninskaya Psychiatric Hospital, since 1931 it has been the I.I. Skvortsov-Stepanov City Psychiatric Hospital No. 3.

[2] Boarders were patients for whom relatives paid from 5 to 500 rubles a month.

Fig. 20. Women's ("maid of honor") building of the Saint Petersburg City Hospital for the Mentally Ill in the name of the Holy Great Martyr and Healer Panteleimon [22]

Рис. 20. Женский («фрейлинский») корпус Петербургской городской больницы для душевнобольных во имя святого великомученика и целителя Пантелеймона [22]

the 5th line of Vasilyevsky Island, where he placed new departments of the hospital for the mentally ill, located nearby. After his death in 1899 the hospital became the property of psychoneurologist, doctor of medicine A.E. Bari (1870–1937). In 1910 the engineer K.I. Niman (1854–?) built a stone three-storey building according to his order. The faceted stained-glass window[1] with geometric pattern (Fig. 23) preserved above the door of the front entrance is especially interesting. A stove faced with green tiles with floral ornamentation has been left in the interiors [31]. After 1917 the hospital was reorganized into the city psychiatric hospital No. 5. Nowadays the building houses the city narcological hospital.

Maternity Hospital No. 1 (14th line of Vasilievsky Island, 19) in the late 1970s was located in the building of a profitable house built in Art Nouveau style by D.N. Zverev in 1909.

[1] A facet is a transparent strip along the edge of thick polished glass that forms an obtuse angle with the main surface.

Fig. 21. The male ("officers") building of the Saint Petersburg City Hospital for the Mentally Ill in the name of the Holy Great Martyr and Healer Panteleimon [22]

Рис. 21. Мужской («офицерский») корпус Петербургской городской больницы для душевнобольных во имя святого великомученика и целителя Пантелеймона [22]

Fig. 22. The building of the A.E. Bari hospital [22]

Рис. 22. Здание лечебницы А.Э. Бари [22]

Fig. 23. The transom with faceted and colored glass above the door of the main entrance of the A.E. Bari clinic [31]

Рис. 23. Фрамуга с фацетным и цветным стеклом над дверью парадного входа клиники А.Э. Бари [31]

The six-storey building with a bay window[1] is faced with light yellow brick, decorated with shaped niches, masonry made of colored bricks, belts made of colored ceramic tiles (Fig. 24).

The building of V.B. Perovskaya's hospital for the poor, or "Olga's shelter for the sick in memory of Gregory" (2nd Murinsky pr., 12, k. 3) is a monument of Art Nouveau architecture. The basement of the W-shaped two-storied building (Fig. 25) is faced with red-gray granite, the first floor is lined with red brick, the second floor is covered with plaster painted in light color. The central and side facades are finished with triangular pinnacles, the entrances are decorated with columns supporting a balcony with a balustrade and a triangular bay window on the second floor. The corner pentagonal two-story bay window with a porch attracts attention; at the second floor level, its large windows are divided by Doric

Fig. 24. The building of the maternity hospital No. 1 [22]

Рис. 24. Здание родильного дома № 1 [22]

[1] A bay window is a prismatic or cylindrical vertical volume with windows protruding from the facade plane, which increases the area of the interior room and improves its illumination.

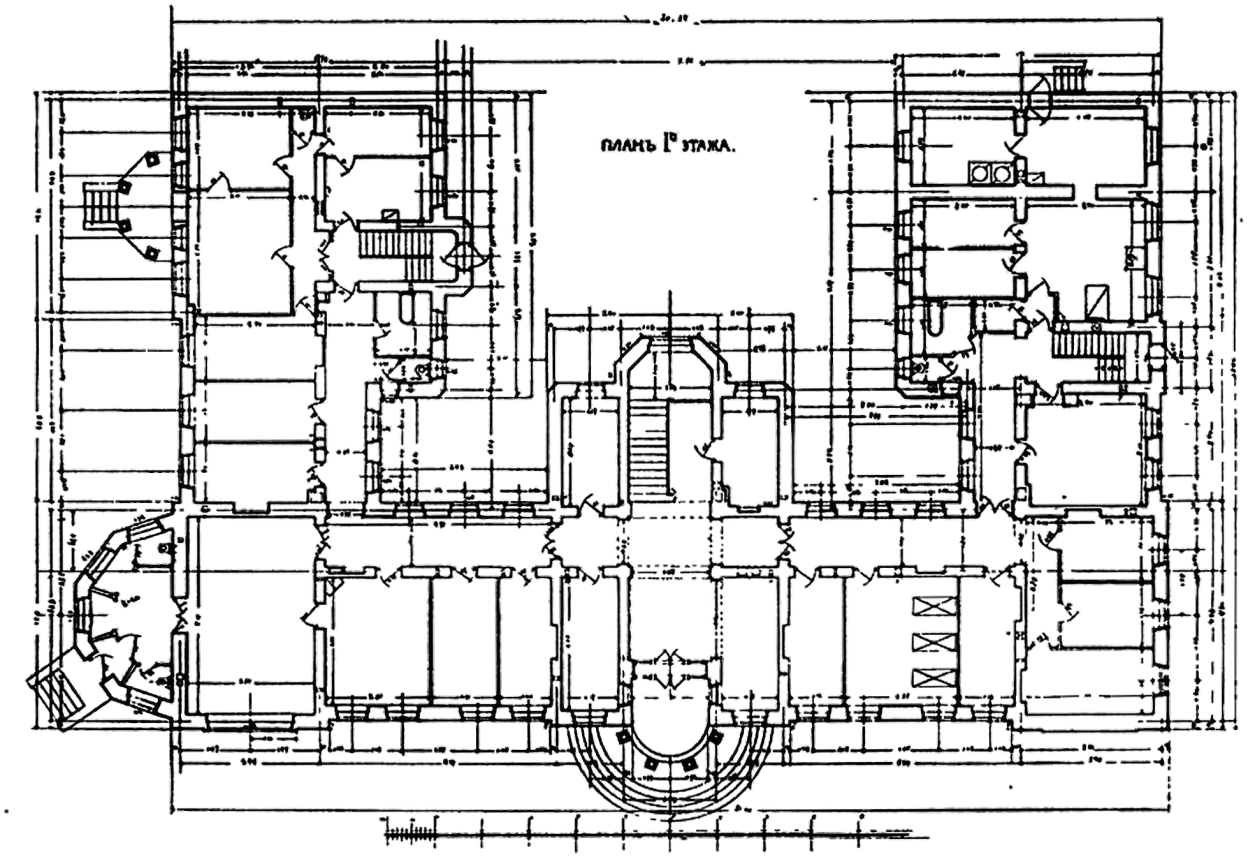

Fig. 25. The building of the V.B. Perovskaya hospital for the poor. First floor plan [32]

Рис. 25. Здание больницы В.Б. Перовской для бедных. План первого этажа [32]

semi-columns. Rectangular platbands of other windows are painted in the color of plaster.

The orphanage was founded by Countess V.B. Perovskaya (1856–1931), a maid of honor of the imperial court. The orphanage was named in her honor after the death of her sister Olga, who contracted diphtheria while visiting the orphanage in Tsarskoye Selo[1]. Initially, the institution was housed in an old wooden building on Spasskaya Street, where 26 patients were accommodated. They were treated and kept free of charge and could be treated for any illnesses, except for contagious ones. Having received an inheritance after the death of her nephew G.M. Petrovo-Solovo in 1911, V.B. Perovskaya decided to build a new stone building for the orphanage. Her nephew's name was added to its title. The founder of the orphanage ordered the project to the famous St. Petersburg architect V.I. Van der Gucht (1876–1943), who, in turn, invited the architect G.E. Ginz (1879–?) to cooperate. The former colleagues from the Academy of Arts completed the project with a wooden two-story house for medical and service staff. The project also included a park with a natural pond and summer pavilions for the sick.

In 1913, the "Olga's Orphanage for the Sick in Memory of Gregory" was opened (Fig. 26). The shelter was intended for the treatment of children and women with diseases of the musculoskeletal system. They managed to create an atmosphere of home comfort inside. The wards were decorated with tasseled curtains, paintings, pouffes, marble fireplaces, fine furniture, carpets, and toys.

From the beginning of the First World War until the spring of 1918 the building housed a 75-bed Red Cross infirmary No. 64 for wounded lower ranks, which was also funded by

[1] The 1877 orphanage named after Her Imperial Highness the Grand Duchess Maria Alexandrovna (29a Leontievskaya Street, Tsarskoye Selo) was founded in Tsarskoye Selo on the initiative of the Grand Duchess Maria Alexandrovna, Duchess of Saxe-Coburg-Gotha (1853–1920), and was originally intended for the care of thirteen orphans — children of soldiers killed in the Russo-Turkish War, then for 20 girls, orphans and half-orphans of poor parents. Countess Olga Borisovna Perovskaya (1853–1898), appointed by the Grand Duchess, became a trustee of the orphanage from the moment of its foundation.

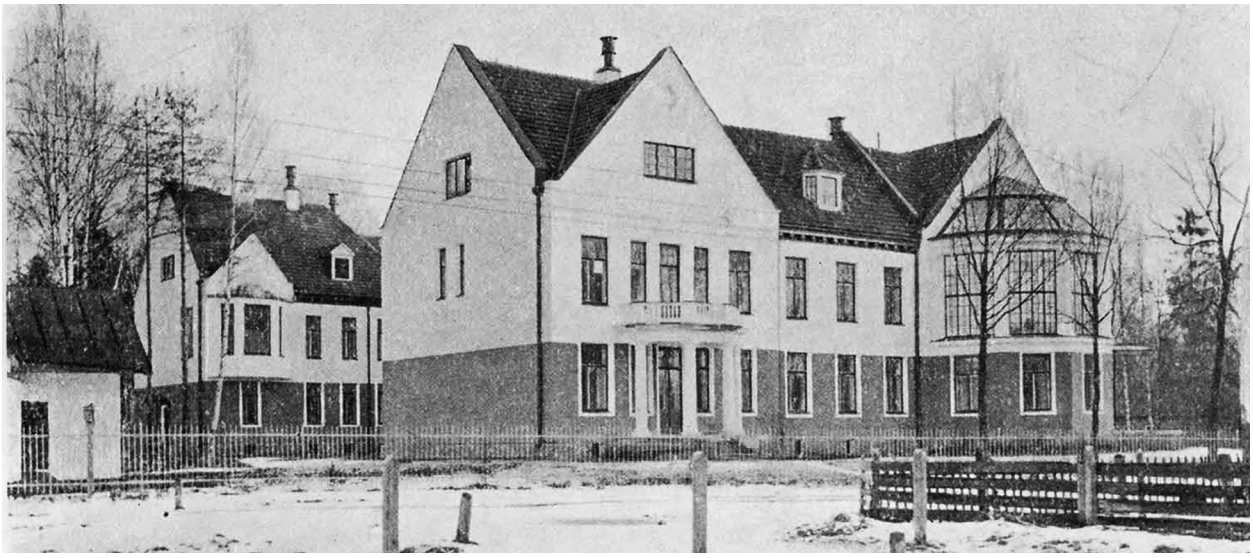

Fig. 26. The building of the V.B. Perovskaya hospital for the poor [32]

Рис. 26. Здание больницы В.Б. Перовской для бедных [32]

V.B. Perovskaya. After the revolution of 1917, there was a need to close the institution due to lack of funds for its maintenance. Vera Borisovna proposed to transfer the building with all the equipment to the Women's Medical Institute of Petrograd for a surgical orthopedic clinic, mainly for bone and tuberculosis patients. In March 1919 the building with all the equipment and land plot was transferred to the jurisdiction of the Provincial Health Department. The medical institution for patients with bone and joint tuberculosis was named Sanitary and Surgical Clinical Hospital[1]. Since 1921 the hospital became the Clinic of the Petrograd Medical Institute and a base for training students, and since 1922 — a base for advanced training of doctors in surgical tuberculosis. In 1924, the pediatric department of the Research Institute of Surgical Tuberculosis was located here [33, 34]. After the Children's Surgical Clinic for Bone and Joint Tuberculosis moved to a new modern building on Polytechnicheskaya Street in 2012, the building was reconstructed to house the Children's Pulmonology Center of the St. Petersburg Research Institute of Phthisiatrics and Pulmonology (Fig. 27).

The central hospital of the Post and Telegraph Department (1 Tyushina St. / 143 Ligovsky Ave.), built in 1913–1914 by M.V. Kobelev (1870–1934), a senior architect of the Main Department of Posts and Telegraphs, was designed in the spirit of national romanticism, which was characteristic for Art Nouveau. Decorative frames of the arched windows of the first and second floors resemble kokoshnik[2].The third, fourth and fifth floors have brovkas[3], balconies are adorned with floral ornamentation (Fig. 28).

Another example of Art Nouveau architecture is the building of the Kronstadt Sea Island Community of Sisters of Mercy of the Russian Red Cross Society (Kronstadt, Proletarskaya Street, 30 / Lazarevsky Lane, 1h). The Sea Island Community of Sisters of Mercy was established on the territory of the Kronstadt Naval Fortress in 1877. It was the only Community that trained sisters to provide medical assistance to the troops at sea. For a long time the Community did not have its own premises. Some of the sisters lived in wards of the Naval Hospital, which was operated by the Community. Trustee

[1] According to a special order of the board of the Regional Health Department, V.B. Perovskaya was left at the hospital, where she worked as a nurse-educator until 1923, when she was forced to leave the service for health reasons. The former countess spent her last years in a wooden staff house (her apartment in the asylum building was occupied by the new head doctor P.G. Kornev), living out her days in poverty, without a pension, selling paintings and other family valuables and relics.

[2] Kokoshnik — semicircular or keel-shaped external decorative element in the form of a false zakomara.

[3] Brovka — a decorative relief arch over an opening or niche.

Fig. 27. The Children's Pulmonology Center. Current view [22]

Рис. 27. Детский пульмонологический центр. Современный вид [22]

Fig. 28. The Central Hospital of the Post and Telegraph Department [22]

Рис. 28. Центральная больница Почтово-телеграфного ведомства [22]

Fig. 29. The Admiral Lazarev Estate hotel-mansion [22]

Рис. 29. Отель-особняк «Усадьба адмирала Лазарева» [22]

of the Community K.N. Makarova (1859–1946) appealed to the main department of the Russian Red Cross Society with a request for the construction of its own building for the dormitory of the sisters and the hospital [35]. After the petition was satisfied in 1915, the architect V.M. Lopatin (1869–?) built a spacious stone house which used to belong to the estate of Admiral M.P. Lazarev. The two-storey L-shaped building looked spectacular. The central entrance, located on the corner, was distinguished by a high porch with a balcony and a turret. The side facades, crowned with gables, were decorated with rich window trim and figurative patterns.

In 1917 the Kronstadt Community ceased its activity, and in 1922 a TB dispensary was opened in the building. However, after the Community moved to a new building on Zosimova Street in the 1990s, the building fell into disrepair. In 2018–2023, a major renovation with restoration was carried out, the adjoining park was also restored. Now the building houses a hotel-mansion "Admiral Lazarev's Estate" (Fig. 29).

Art Nouveau architecture, which replaced eclecticism, became a creative rethinking of the entire history of European art and marked the beginning of the New Art. Using all the architectural innovations of this style, hospital buildings in St. Petersburg retained the classical rigor, but most importantly – they were as functional as possible. The Art Nouveau era was reflected both in the decorative design of buildings, and in the equipment of hospitals, the competent layout of buildings, and the creation of a more comfortable environment for medical institutions.

ADDITIONAL INFORMATION

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

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REVIEW OF INTERNATIONAL PRACTICE OF THE USE OF NATIONAL MEDICAL INCIDENT REPORTING SYSTEMS

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ABSTRACT. Analysis of adverse events that happen in medical organizations has proved to be a crucial instrument of improvement of quality and safety of healthcare. Foreign countries make ample use of national incident reporting systems for this aim. The work of national incident reporting systems involves not only leaders and managers of healthcare but the personnel of medical organizations as well. National systems accumulate information, analyze it and later based on this analysis the organizational decisions are being made, which are aimed at correction and prevention of future faults or associated problems in the medical organizations. Unified national system like this does not exist in the Russian Federation that is why the aim of this research was to analyze the foreign practice of using national incident reporting systems in order to form recommendations for the creation of similar system in the Russian Federation. In this study practical experience of Denmark, United Kingdom, China and Kazakhstan was described, the negative and positive aspects of the organizational decisions of these countries were highlighted, as well as the results of their performance were presented. Based on the given information the recommendations on the creation of a similar system in the Russian Federation were proposed including improvement of legislation norms, the use of digital solutions while designing and implementing the system, which will be improved regularly based on feedback and the results of performance check. It is also necessary to ensure that this system will be easy to use, transparent and fair.

KEYWORDS: incidents, quality of healthcare, adverse events, foreign practice

ОБЗОР МЕЖДУНАРОДНОГО ОПЫТА ПРИМЕНЕНИЯ НАЦИОНАЛЬНЫХ СИСТЕМ СБОРА МЕДИЦИНСКИХ ИНЦИДЕНТОВ

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РЕЗЮМЕ. Важным инструментом совершенствования качества и безопасности медицинской деятельности является анализ всех неблагоприятных ситуаций, случающихся в организации. С этой целью в зарубежных странах используются национальные системы сбора инцидентов, в функционирование которых вовлечены как руководители и организаторы здравоохранения, так и персонал всех медицинских организаций. Национальные системы аккумулируют информацию, анализируют ее, на основании чего в дальнейшем принимаются управленческие решения, направленные на коррекцию и профилактику повторения ошибок или организационных проблем, встречающихся в учреждениях здравоохранения. Подобная единая национальная система отсутствует в Российской Федерации, поэтому целью данного исследования стало изучение зарубежного опыта функционирования национальных систем сбора инцидентов, произошедших в медицинских организациях, и формирование на его основании рекомендаций по построению аналогичной системы в Российской Федерации. В ходе исследования был описан практический опыт Дании, Великобритании, Китайской Народной Республики, Республики Казахстан, и были выделены позитивные и негативные аспекты организационных решений, используемых данными странами, а также приведены результаты их деятельности. На основании изученных данных были предложены рекомендации по созданию системы сбора инцидентов в Российской Федерации, включающие в себя совершенствование законодательства, использование цифровых решений при проектировании системы, которая будет регулярно совершенствоваться на основании обратной связи и анализа результатов ее работы, а также обеспечение ее простоты, прозрачности, справедливости.

КЛЮЧЕВЫЕ СЛОВА: инциденты, качество медицинской помощи, нежелательные события, зарубежный опыт

INTRODUCTION

The activities of medical organizations are inevitably associated with risks for patients and medical personnel. The use of medications, medical equipment, invasive diagnostic and therapeutic techniques makes errors in the delivery of medical care dangerous to the health of participants in this process. This can be explained by the fact that any violation of technology and standards can lead to adverse consequences.

In this regard, it is important that information about adverse events that have occurred or may occur reaches the department heads and higher-level leaders for study and taking measures to prevent their recurrence. Accumulation of such information can be carried out through an incident collection and analysis system.

In the United Kingdom healthcare system, a "patient safety incident" is defined as "an event in the course of medical care delivery that could have resulted, or did result, in harm to a patient's health" [1]. The World Health Organization gives a similar definition of the term "incident" [2].

The collection and analysis of incidents occurring on the premises of a medical organization is a valuable instrument for its leaders. Incident reporting expands the range of information available to them, allowing them to take timely organizational measures aimed at correcting real problems.

In the Russian Federation, there is no definition of the term "incident" applicable to a medical organization at the legislative level, and there are no widespread incident repor-

ting systems. Some organizations have independently implemented this system, but on their own initiative. Its implementation was mainly associated with the preparation of medical organizations for further accreditation / certification in accordance with the standards of quality and safety of medical care (for example, international standards of Joint Commission International or national standards of Roszdravnadzor).

A different situation is observed in many foreign countries. For example, in Denmark and the United Kingdom, national incident reporting systems have existed for over 20 years. During the work of these systems, information is collected at the national level from all medical organizations to make decisions based on its analysis not only at the level of the medical organization, but also at the level of the health system as a whole.

In Sweden, incident reporting systems were implemented using the Internet in all regions of the country in the mid-2000s [3] and are still actively used in medical care today. According to a 2011 survey of healthcare leaders, incident reporting and root cause analysis have become one of the most crucial instruments for achieving high levels of patient safety [4].

Swedish law requires the leadership of each administrative region to publish annual patient safety reports. These reports have been used since 2011 to monitor trends in patient safety and correct identified gaps [5]. 19 out of 21 regions include information in the report on whether they have an electronic incident reporting system, and 18 of them also include information on the results working with incidents [6].

The experience of systematic work with medical incidents has been described not only in European countries, but also in Asian countries. The People's Republic of China has also implemented an incident reporting system, which has not yet achieved the same positive results as similar instruments in European countries.

The Republic of Kazakhstan, which is close to the Russian Federation both territorially and culturally, actively working on improving the organization of medical care that is safe for patients, including at the legislative level. This is evidenced by the development, approval and updating of regulatory documents that provide an official definition of the concept of "medical incident" and describe the procedure for working with them.

It is worth noting that work on improving the quality and safety of medical care is not limited to the creation of such a system. It also requires its constant improvement and development based on the results obtained and feedback from health workers.

Taking into account the interest of foreign healthcare leaders in using incidents as an instrument to ensure patient safety, it is advisable to consider their experience to identify the most valuable practices that can be applied in implementing such a system in the Russian Federation.

AIM

The aim of the study is to examine foreign experience in the functioning of national systems to collect incidents that occurred in medical organizations. It is also necessary to provide recommendations on the basis of this experience for creation of a similar system in the Russian Federation.

MATERIALS AND METHODS

During the research, an analysis of public data sources from the PubMed, Cyberleninka, and eLIBRARY databases was carried out to study foreign experience in the implementation of the system of incidents in national health systems.

RESULTS

A number of countries have national systems aimed at collecting information on patient safety incidents.

The first such system was the Danish Patient Safety Database (DPSD), which was created and implemented in January 2004 [7]. Initially, the system was aimed at collecting incidents that occurred in hospitals, but in 2010, it also included organizations providing primary health care [8]. As part of its expansion, the ability to collect incidents not only from medical workers, for whom participation is mandatory, but also from patients and their relatives [9], who can, if they wish, write an incident report, was implemented in 2011.

The incident report form is filled out online and includes the following information: incident

description, time and place, patient's gender, suspected causes of the incident, and proposed preventive measures. If the information is provided by medical workers, they independently indicate the type of incident and its severity. If the incident is received from a patient or a close relative, it is classified by a risk manager [10].

Incidents are considered at three levels. At the healthcare organization level, incidents are reviewed to analyze root causes and implement preventive measures. Analysis at the regional level is used to train personnel of medical organizations in the region. Incident review at the national level is conducted to monitor statistics and study the total number of incoming incidents for use as a basis for creating general recommendations.

The incident does not entail disciplinary action against the health worker who reported it, since this system is strictly separated from the systems that control or handle complaints. They exist in parallel and do not exchange information. However, if complaints or comments are received externally from supervisory authorities about this event, then the employee may still be subject to measures of influence [11].

The system has shown significant growth and increased involvement of healthcare personnel during its existence. Thus, if 12,370 incidents were recorded in 2006, then in 2012 there were already 155,791 [12]. Subsequently, the growth continued. Thus, during the 2021 study [10], incidents received from nurses, doctors, patients and their relatives for the period from 2014 to 2015 were studied. Their total number was 241,606, while the study did not include incidents received from other personnel of medical organizations (there were 131,314 of them). The statistics of the studied data showed that most often incidents were reported by nurses (81.3%) and doctors (16.1%), the share of incidents received from patients (1.2%) and their relatives (1.4%) was small. The most frequently recorded incidents were in the following categories: "medicines" (53.8%), "patient accidents" (17.2%), "treatment and care" (7.0%).

Despite the positive quantitative performance indicators of the system, its implementation and expansion has been heavily criticized by personnel. The bulk of the comments was related to the high bureaucratization of the system, which resulted in an incident recording taking 20–30 minutes and an average of 1 hour to be considered. This problem was exacerbated by the receipt of a large number of incidents describing minor situations, which could not cause significant harm to the patient. As a result, the increase in quantitative performance indicators of the system was not accompanied by qualitative results, since it proved difficult to process and identify useful patterns among hundreds of thousands of incidents [13].

In response to these comments, a working group consisting of representatives of patient organizations, trade unions, professional societies, regional and municipal leadership developed recommendations for optimizing the Danish incident reporting system. The following changes were proposed:

- limiting the range of incidents collected (collecting only those that resulted in moderate or serious harm to health, revealed new problems, were useful for training personnel or were relevant for the clinic);
- facilitating the process of their registration (simplifying the form, creating submission templates);
- priority for working with incidents at the level of a medical organization;
- organization of experience exchange between health institutions;
- inclusion of the system in quality programs of medical organizations;
- increasing the transparency of the health system (publication of information about individual incidents on the websites of medical organizations, following the example of Norway) [14].

The data published by Danish scientists indicate that the incident reporting system cannot exist statically. It needs to be constantly improved, based on feedback from the medical personnel working with it.

The United Kingdom (hereinafter referred to as the UK) is an example of active work to improve such a system. In this country, the National Reporting and Learning System (NRLS) was launched only a month later than Denmark, in February 2004 [15], and continued to function until July 2024.

The system was developed and implemented in the UK between 2001 and 2004, based on the experience of incidents in Australia and the United States of America. More than 28,000 incidents were collected during the pilot project in 2001–2002. Based on them, conclusions were

made about the project's shortcomings related to the low quality of incoming information and problems with the digitalization of the process. The work carried out following the pilot project to integrate the incident reporting process with the medical information systems of healthcare organizations made it possible to achieve significant results. Thus, in the period from November 2003 to September 2005, 303,447 incidents were received, of which 68.3% described situations that did not result in harm to the patient, and 0.7 and 0.4% reported problems that resulted in serious harm to health or death of the patient, respectively [16].

The UK National Health Service has published reports on incidents received in the database on its official website until 2023, and has also posted individual cases of using the information received to improve the provision of medical care within the national health system. Data available to the general public shows a significant increase in the use of the system by medical organizations. Thus, if about 100 thousand incidents were submitted in April–June 2005, then in the same period in 2022, more than 600 thousand were recorded [17]. The publication of reporting documentation was suspended in 2023, as part of the transition to the new system.

NRLS was discontinued on July 30, 2024, and replaced by the Learn from Patient Safety Events (LPPSE) system. Its advantage over its predecessor is the expansion of capabilities through the use of machine learning elements, as well as the optimization of its application by organizations delivering primary health care.

In the new system, when filling out a form, personnel or patients select the type of incident, what it was related to (medications, equipment, IT, blood and its components, etc.), describe the event. They also note relevant safety issues (bedsores, falls, radiation therapy issues, hospital-acquired infections, etc.), indicate the date and place of the incident, patient details if they were injured (age, severity of harm, outcome).

Incidents can be registered with a personal account or anonymously. In the second case, the initiator is asked to indicate the reason for choosing anonymity. The above points are a mandatory part of incident registration. After filling out and saving them, the initiator may, at his own discretion, complete additional sections, indicating additional details (information about the medications, equipment, etc.) [18].

Currently, in the UK, incidents resulting in serious harm or death and events that should not have happened (serious, preventable situations related to patient safety that would not have occurred if medical personnel had used preventive measures) are mandatory for registration [19]. These incidents since 2018 include, for example, performing wrong-site surgery, leaving a foreign object in the body of a patient during surgery, choosing the wrong-route drug administration, etc. [20]. The preventability of many of them is currently being questioned [21], as a result of which changes to this list are planned at the national level.

Reported incidents are subject to review, based on the results of which a decision is made on corrective measures. Unlike Denmark, the UK does not guarantee that personnel will not be punished for the event that caused the incident. However, the National Health Service encourages the development of a "fair culture", which is based on a rational approach to studying the incident and its causes [22]. Before making a decision on punishment, leadership has been asked to assess the situation on a number of points, which will help to determine the extent of the employee's personal contribution to the incident. This approach is intended, on the one hand, to protect medical staff from undeserved accusations and punishments, while reducing their fear of reporting incidents. On the other hand, it aims to leave leadership the opportunity to apply disciplinary sanctions to personnel, intentionally harmed or deviated from the algorithms and instructions [23]. The described culture has been implemented in the UK healthcare organizations, but surveys show the need for further work on this issue, including in terms of awareness of healthcare workers [24].

The People's Republic of China (hereinafter referred to as the PRC) has an even stricter position on the reporting and analysis of incidents. Thus, the PRC has the National Patient Safety Incident Reporting System (NPSIRS), launched in early 2012, which received 36,498 incidents between 2012 and 2017 [25]. Reporting incidents in the PRC is mandatory for personnel and does not provide the option to report them anonymously. Healthcare workers are required to inform the leadership of any incidents they have

participated in or witnessed through the hospital incident reporting system. The accumulated information is submitted to the national database by the manager of the healthcare organization.

Each report provided to the NPSIRS includes administrative details (time/place, participants), patient information, actions taken, harm assessment, and a field for describing the event in your own words [2].

The NPSIRS was not the first attempt to implement a medical incident information collection system at the national level. Similar initiatives were also undertaken in 2004 by the state and in 2008 by the Chinese Medical Association, but have not been widely adopted [26].

The effectiveness of the current national system for reporting patient safety incidents has also been questioned in publications by Chinese authors. The design features of the system, which involve collecting incidents in a national database for subsequent decision-making, have led to the conclusion that it is ineffective and has little impact on the care provided. This is explained by the fact that "only timely identification of errors makes it possible to take proactive actions aimed at clinical changes and improvements" [27].

The number of incidents reported to the PRC system is significantly lower than in Denmark and the UK, despite the fact that their registration is mandatory for medical personnel. Research by Chinese scientists suggests that one of the reasons is the fear of healthcare workers being blamed or punished. Articles on the study of safety culture in China highlight the fear of punishment as one of the most important obstacles to the development of this system. The survey of personnel of medical organizations in the PRC demonstrated a positive assessment of patient safety, but also indicates the prevalence of fear of blame and punishment (65%) and fear of shame (20%) among staff [28]. The survey of medical personnel in Changsha also highlighted the lack of penalties for mistakes as a safety culture parameter that needs improvement. In general, staff "worried that the errors they made would be reflected in their personal files and affect their future career opportunities" [29].

Another country that has implemented a national incident system is the Republic of Kazakhstan, where the Order No. KR DCM-147/2020, issued by the Minister of Health of the Republic of Kazakhstan on October 22, 2020 "On approval of rules for determining cases (events) of a medical incident, their recording and analysis" approved the concept of a medical incident. According to this document, this term is defined as "an event related to the provision of medical care in accordance with the standards for organizing medical care using technologies, equipment and instruments, caused by a deviation from the normal functioning of the body, which can harm the life and health of the patient, as well as lead to the death of the patient, with the exception of cases provided for by the administrative and criminal law of the Republic of Kazakhstan".

Medical incidents in the Republic of Kazakhstan include, for example, drug allergies, complications of medical interventions, as well as medical device adverse events.

According to the Order No. KR DCM-147/2020, issued by the Minister of Health of the Republic of Kazakhstan on October 22, 2020, information about the incidents is received from healthcare workers to the patient support service and internal examination of the medical organization. In this case, medical personnel get additional financial incentives for submitting information about incidents. Based on the collected information, a certificate is generated. After receiving approval from the head of the medical organization, this document is sent to an organization subordinate to the authorized body in the field of healthcare, to record cases of medical incidents. The events that occurred, their causes, and a brief description of the cases treated are indicated. The name of the medical organization is not indicated.

The authorized body shall keep records of medical incidents based on information received from medical organizations, as well as from government agencies in the areas of medical services (assistance), sanitary and epidemiological well-being of the population, circulation of medicines and medical devices or their territorial divisions.

On June 26, 2024, the Order No. 32 of the Acting Minister of Health of the Republic of Kazakhstan was approved in Kazakhstan. It came into force on October 23, 2024 and contained the Rules for the formation and maintenance of a single register of a medical incidents and insurance cases. According to the document, medical organizations must send information on the occurrence of a medical incident or insurance case

to a subordinate organization determined by the authorized body in the field of healthcare on a quarterly basis. The unified register is maintained in electronic format. It includes the following information about incidents: date, time, type, consequences, circumstances that led to it, profile, anamnesis of life / disease, patient's age / gender / diagnosis, whether assistance was provided, whether measures were taken to eliminate and prevent recurrence, whether a corrective action plan was drawn up.

Thus, the countries described have different approaches to the work and organization of the incident reporting system and subsequent work with them. The data collected during functioning of the system differ (Table 1), as well as the approach to communication with the personnel providing the information.

The reports of all the countries studied included data about the time and place of the incident, patient's gender. Three of the four also included mandatorily a description of the event, the severity of the harm caused, and the type / kind / category of the incident. The least frequently asked questions were about the participants (China) and about the safety issues associated with the incident (the UK).

DISCUSSION

International experience in the application and development of incident reporting systems demonstrates the interest of healthcare leaders in this method of improving the quality and safety of medical organizations.

However, it is impossible to talk about the existence of a global standard, since countries use different incident management programs, collect different information from each other and organize work with the received data in accordance with their own needs and projects.

Work on an incident reporting system does not end with the creation and implementation of the initial project, but often requires significant changes in its functioning, up to and including a change in the underlying architecture. This fact can be noted in the description of the experience of foreign countries: the collection and analysis of incidents in each of them underwent significant changes during its existence, up to a complete change in the instruments used. The reason for this could be widespread criticism of practical implementation (Denmark), low efficiency (the PRC), or the emergence of opportunities for its improvement through the development

Table 1

Data filled in during the creation of incident reports

Таблица 1

Данные, заполняемые в ходе формирования отчетов об инцидентах

Заполняемые сведения об инциденте / Incident details to be filled in	**Дания / Denmark**	**Великобритания / United Kingdom**	**Китай / China**	**Казахстан / Kazakhstan**
Описание / Description	Да / Yes	Да / Yes	Да / Yes	Нет / No
Время и место / Time and place	Да / Yes	Да / Yes	Да / Yes	Да / Yes
Участники / Paricipants	Нет / No	Нет / No	Да / Yes	Нет / No
Профиль / анамнез / диагноз пациента / Profile / anamnesis/ diagnosis of patient	Нет / No	Нет / No	Нет / No	Да / Yes
Пол пациента / Patient's gender	Да / Yes	Да / Yes	Да / Yes	Да / Yes
Тяжесть нанесенного вреда / Severity of harm	Да / Yes	Да / Yes	Да / Yes	Нет / No
Исход / Outcome	Нет / No	Да / Yes	Нет / No	Да / Yes
Предпринятые действия / Actions taken	Нет / No	Нет / No	Да / Yes	Да / Yes
Причины / Cause	Да / Yes	Нет / No	Нет / No	Да / Yes
Проблемы безопасности / Safety problems	Нет / No	Да / Yes	Нет / No	Нет / No
Профилактические меры / Preventive measures	Да / Yes	Нет / No	Нет / No	Да / Yes
Тип / категория / Type / category	Да / Yes	Да / Yes	Нет / No	Да / Yes

of technologies, including artificial intelligence (the UK).

Among the foreign systems described, Denmark and the UK had the best results, showing an active growth in the number of incidents entering the database. One of the reasons for this may be the specifics of the organization of their analysis, which is aimed not at punishing the guilty party, but at identifying the root causes. This approach to work helps reduce the fear of punishment experienced by personnel, thereby facilitating their involvement in the process.

Studying the experience of foreign countries, we can note the following principles that should be taken into account when creating a similar system.

1. Fixing at the legislative level the definition of the term "incident", as well as a list of incidents that must be submitted, and the procedure for collecting them. These measures are necessary to eliminate differences in the interpretation of both the essence of incidents and the need to collect them.

2. Creating a simple and convenient incident recording algorithm that does not require medical and management personnel to spend a lot of time and does not lead to excessive bureaucratization of the process.

3. Focus on the analysis and application of incidents primarily at the level of medical organizations. As the experience of Denmark and China shows, collecting incidents at the national level for further use in decision-making at the state and regional levels has been often ineffective due to the long duration of the process. Therefore, the collected incidents should be first of all analyzed at the level of medical organization for timely implementation of corrective and preventive measures.

4. Defining a clear list of incidents that should be transferred by the medical organization to higher levels (regional, state), to facilitate their processing and decision-making based on them.

5. Creating favorable conditions for the registration of incidents by employees of medical organizations. An example is the adaptation of the UK experience in building a "fair culture". This approach provides clear criteria for decision-making based on the results of a situation analysis and protects conscientious personnel from the potential consequences of recording incidents.

6. Regularly improving the system based on feedback from medical workers, as well as statistics on the information received, using digital solutions, and upgrading them as technology develops.

These recommendations are based on the experience of foreign countries that have implemented incident reporting systems at the national level with varying degrees of success. However, the article has a number of limitations: it describes the example of only five countries, while there are other countries that have similar experience, but are not considered in the study. Moreover, the features of national health legislation and model may affect the effectiveness of implementing such practices in other countries.

For example, the most important issue is the legal status of medical incidents, the possibility of using them as instruments for punishing personnel. As the studied experience shows, even the possibility of punishment within a medical organization has a sufficiently strong negative impact on motivation, that hinders the successful functioning of the system. In addition, the potential use of incidents by law enforcement agencies for the purpose of criminal or administrative prosecution of medical workers or organizations will probably completely destroy the chance to attract personnel to voluntary participation in its work.

These points should be considered in advance and taken into account when developing a project for the implementation of such a system.

CONCLUSION

The collection and analysis of incidents can be a valuable instrument for of healthcare leaders and higher authorities. However, its effective implementation requires creating a high-quality system that will ensure simple and transparent interaction with it.

Health leaders in many countries around the world are actively using this instrument to improve the quality of medical care. The success of this initiative varies depending on the approach to working with incidents and interacting with personnel. This makes these features important to study and take into account when making recommendations on the creation and implementation of a system for collecting and analyzing incidents in the Russian Federation.

Currently, in Russia, there is no legislative definition of the term "medical incident", and the collection of incidents is carried out exclusively by individual organizations as a compo-

nent of the activities of healthcare quality control services. As a result, a large share of information that could be used to improve the activities of individual medical organizations, as well as regional or interregional health management does not reach senior leaders.

For this reason, the development of a clear, legally established incident reporting system in the Russian Federation, based on the study of foreign experience, is a relevant instrument for improving the quality and safety of medical care. Creating a digital circuit that ensures the collection of this information will make its use simple, convenient and protected in terms of cybersecurity. The transition to a "fair culture" in medical organizations will increase the readiness of personnel to inform leadership about adverse events that have occurred or about potential errors and problems.

A system created on these principles will most likely be accepted by employees of medical organizations, whose voluntary and active participation in this initiative is an essential component of its success.

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ПРАВИЛА ДЛЯ АВТОРОВ

тв. 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.

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

В Журнале печатаются ранее не опубликованные работы по профилю Журнала.

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

Размещение публикаций возможно только после получения положительной рецензии.

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

ПРЕДСТАВЛЕНИЕ РУКОПИСИ В ЖУРНАЛ

Авторский оригинал принимает редакция. Подписанная Автором рукопись должна быть отправлена в адрес редакции по электронной почте на адрес medorgspb@yandex.ru или lt2007@inbox.ru. Автор должен отправить конечную версию рукописи и дать файлу название, состоящее из фамилии первого автора и первых 2–3 сокращенных слов из названия статьи. Информацию об оформлении можно уточнить на сайте: http://www.gpmu.org/science/pediatrics-magazine/Medicine_organization.

СОПРОВОДИТЕЛЬНЫЕ ДОКУМЕНТЫ

К авторскому оригиналу необходимо приложить экспертное заключение о возможности опубликования в открытой печати (бланк можно скачать на сайте https://www.gpmu.org/science/pediatrics-magazine/).

Рукопись считается поступившей в Редакцию, если она представлена комплектно и оформлена в соответствии с описанными требованиями. Предварительное рассмотрение рукописи, не заказанной Редакцией, не является фактом заключения между сторонами издательского Договора.

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

АВТОРСКОЕ ПРАВО

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

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

ПОРЯДОК АКЛЮЧЕНИЯ ДОГОВОРА И ИЗМЕНЕНИЯ ЕГО УСЛОВИЙ

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

ОФОРМЛЕНИЕ РУКОПИСИ

Редакция журнала приветствует полностью двуязычные статьи.

Статья должна иметь (НА РУССКОМ И АНГЛИЙСКОМ ЯЗЫКАХ):

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

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

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

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

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

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

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

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

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

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

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

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

Статья из журнала

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

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

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

Тезисы докладов, материалы научных конф.

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

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

Авторефераты

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

Описание интернет-ресурса

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

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

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

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

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

Технология подготовки ссылок с использованием системы автоматической транслитерации и переводчика.

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

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

Примеры транслитерации русскоязычных источников литературы для англоязычного блока статьи

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

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

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

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

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

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

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

Тезисы докладов, материалы научных конф.

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

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

Авторефераты

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

Описание интернет-ресурса

Shcheglov I. Naskol'ko velika rol' mikroflory v biologii vida-khozyaina? [How great is the microflora role in type-owner biology?]. Zhivye sistemy: nauchnyy elektronnyy zhurnal. Available at:

http://www.biorf.ru/catalog.aspx?cat_id=396&d_no=3576 (accessed 02.07.2012). (in Russian).

ОТВЕТСТВЕННОСТЬ ЗА ПРАВИЛЬНОСТЬ БИБЛИОГРАФИЧЕСКИХ ДАННЫХ НЕСЕТ АВТОР.

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

Структура основного текста статьи.

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

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

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

Объем рукописей.

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

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

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