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ARCHITECTURAL METHODS FORMING CHILDREN'S MEDICAL COMPLEXES IN THE CONDITIONS OF RECONSTRUCTION

Abstract. The evolution of architecture of medical buildings and constructions leads to the formation of the modern appearance of medical institutions. Creation of the optimal medical environment directly depends on architectural-planning, town-planning peculiarities, as well as operational factors. Properly designed building, its location, interior space and operating conditions play an important part in providing comfortable and effective medical care. Modern and innovative methods to the reconstruction of children's medical complexes make it possible to create unique and functional buildings. They are able to significantly improve the quality of medical care and provide comfort for both patients and a medical staff. By using advanced technologies, modern materials and design solutions, it is possible to achieve an optimal combination of aesthetics, efficiency and safety. A professional method to the implementation of projects for the reconstruction and modernization of medical facilities plays a key role in creating a favorable environment for the treatment and restoration of health.

Keywords: architecture, reconstruction, modernization, medicine, layout, functionality, adaptation.

STATEMENT OF THE RESEARCH PROBLEM

When researching the history of architecture of medical buildings and structures, it becomes evident that it was influenced by time, the laws of development of urban planning, architecture and social environment. This evolution has led to the emergence of the modern appearance of medical facilities.

Over time, existing medical buildings and structures have lost their importance due to the new demands of the modern world. In the past, the design of medical facilities was based on minimum comfortable space for human beings. However, nowadays, we are witnessing a new method to the architecture of medical facilities. The rapidly changing needs of society require the adaptation and construction of new, maximally comfortable and efficient medical facilities. Today's buildings should be oriented towards providing an optimal level of comfort to patients and staff, provide timely access to modern technologies, and possess functionality capable of realizing all new requirements and quality standards [2]. The provision of medical care for children is based on several principles, which include constant supervision, close co-operation between medical specialists and stepped care, including outpatient appointments, inpatient stays and treatment in sanatorium settings [3]. Since the buildings and structures of children's medical complexes are of different types, the method to their reconstruction should be individualized [1]. The formation of the therapeutic environment depends on urban planning features, architectural and planning solutions and operational factors, and in the conditions of reconstruction and modernization it is necessary to be guided by these criteria [4]. No less important is the preservation of the historical value of buildings, their harmonious integration with modern architectural solutions. This makes it possible to create a unique space that promotes recovery and psychological well-being of children.

ANALYSIS OF PREVIOUS STUDIES AND PUBLICATIONS

Writing this article was preceded by studies of works on the history of the formation of medicine by Y. P. Lisitsyn, T. S. Sorokina; the theory of architecture by A. V. Ikonnikov, V. A. Nefedov, Z. N. Yargina; complex issues of the development of design solutions of medical facilities in the works of A. N. Shinkarev, E. I. Prokofiev, and O. N. Cheberova; architectural modernization of medical facilities in the study of A. M. Yugov, T. V. Radionov,



S. A. Andreeva. Experimental and conceptual developments in the field of reconstruction of urban development objects, as well as the significance of reconstruction were discussed in the works by H. A. Benai and T. V. Radionov; identification of the principles of formation of the living environment for low-mobility groups were studied in the scientific works by N. V. Sholukh, A. V. Anisimov.

PURPOSE OF THE SCIENTIFIC WORK

In the study, the main attention is paid to the identification and classification of a variety of architectural methods to create a comfortable therapeutic environment of buildings and structures of children's medical complexes, which will help to identify specific tasks and requirements for the restoration and improvement of these objects in the future. In addition, the study aims at development of theoretical and prospective architectural-typological models that will describe functional-spatial and architectural-planning solutions for children's medical centers.

BASIC MATERIAL

The reconstruction and modernization of medical buildings and structures should take into account the long-term strategy of architecture and urban planning, the main principles of which include the rational use of territory, creation of comfortable and safe spaces, increasing energy efficiency of buildings, preservation of historical values and attracting investment in development. An important task in the renovation of medical buildings and structures is to optimize space, taking into account the specific needs of medical services. It is necessary to create an efficient space layout, taking into account patient flow, safety, ergonomics and functionality of the space. By reconstructing and modernizing medical buildings and facilities, taking into account the principles of sustainable development, we are building a better future for ourselves and future generations, providing high-quality and modern medical care to the population [6].

In today's world, the requirements for medical centers are becoming more and more stringent and diverse. Today people expect from medical centers not only high quality of the medical care, but also its accessibility, efficiency and innovativeness. Medicine is constantly evolving and introducing new technologies and treatment methods. These innovations require corresponding changes in the infrastructure of medical facilities. Adaptation of buildings and facilities to these new technologies is necessary to ensure a high level of medical care.

One of the key aspects of building renovation is the provision of sufficient space for the installation of new equipment. Modern medical technologies such as magnetic resonance imaging (MRI) or computed tomography (CT) require specialized space and infrastructure for their installation and use, as well as improved power and communication infrastructure. Renovation of buildings will make it possible to create suitable conditions for new equipment and install modern power supply and communication systems, which will ensure reliability and efficiency of new medical technologies, as well as improve the quality of medical care and the comfort of all its participants [8].

However, the renovation of buildings needs to be carried out not only in terms of new technologies, but also taking into account the needs of patients and medical staff. The creation of comfortable spaces for patients, convenient and safe ways of travelling, as well as functional working spaces for medical staff, is an integral part of building renovation.

An important aspect is to take into account the changing perceptions of a comfortable environment, aimed at improving architectural and urban planning, functional-planning, volumetric-spatial, compositional and artistic solutions. Based on this, several architectural methods to creating an adaptive environment of children's medical centers are proposed.

Architectural and urban planning method. The architectural and urban planning method is a comprehensive methodology for the design and development of the environment that takes into account many aspects such as functionality, aesthetics, ecology, social adaptation and economic sustainability. The main goal of this approach is to create spaces that will meet the needs of different user groups, promoting their active interaction and comfortable presence. The architectural and urban planning method should follow a strategy of optimizing the location of children's medical complexes, taking into account the need to reduce negative impacts and noise [5].

The location of children's health care facilities in the historical center of the city has many advantages. Firstly, this location guarantees high accessibility of services for children and their parents. In addition, children's medicine in the historical part of the city becomes a dominant element in the surrounding development due to its expressive architecture. Often such institutions are real architectural monuments. However, when reconstructing such a building, specific constraints related to its location and shaping should be taken into account. It is necessary to develop planning solutions and functional content, taking these factors into account. Special attention should be paid to the indoor recreational area as an integral part of a comfortable stay. In case of lack of space inside the building, it is possible to consider options for increasing the recreational area on the grounds around the institution.

Location in a business center provides for a convenient location of the facility near public facilities of significance to the community. Such localization requires the development of optimal functionality and adaptation of an existing facility using advanced technology and appropriate medical standards [6]. It is essential to consider the functionality and ergonomics of each element of the facility's planning structure to ensure efficiency in work areas and provide comfort for patients.

Facilities located on the periphery of a city are usually large medical complexes serving not only the city or district, but also the entire region. One of the main features of such location is the complex transport and pedestrian accessibility, but at the same time there is a potential for further expansion by combining different blocks. It is important to develop an optimal planning structure, taking into account the multifunctionality of the complex and its overall belonging to the city.

Out-of-town locations are allocated plots of land, which are mainly occupied by large medical centers serving as regional facilities. Thanks to this location, removed from the hustle and bustle of the city, there is an opportunity to expand and further modernize the facilities with comfortable infrastructure and flexible layout.

The natural potential of the selected territories allows the creation of a unique therapeutic space that takes full account of the natural environment and includes spacious areas that contribute to the creation of a calm and relaxing atmosphere [5]. It should also be taken into account that the considered examples of architectural and urban planning accommodation are located, one way or another, near transport communications, industrial facilities and in areas with variable environmental conditions. Therefore, it is important to take into account the peculiarities of the environment and regional conditions in order to minimize possible negative consequences of such placement.

Functional planning method. In the renovation and modernization of children's medical complexes, the functional planning method plays an important role in creating an efficient, comfortable and safe space. This method is based on a thorough analysis of the existing spaces and structures of the medical complex; the needs of the health care facility; and determining the optimal location and function of each space. It is important to identify which spaces require renovation and modernization first, where new elements need to be added, and to take into account the needs of different age groups of children as well as specific requirements to maximize comfort and safety. The layout should ensure:

- convenience for patients, staff and visitors, minimizing the risk of nosocomial infections and compliance with health standards;
- taking account of flows and optimizing the use of space as well as maximizing efficiency;
- organizing spaces for children to relax and play and creating a friendly and pleasant atmosphere.

In the existing children's health centers, there are serious problems with the lack of space, lounge and waiting areas. It is important to provide flexibility in the layout so that these spaces can be adapted to fulfill different functions when necessary. The renovation of medical facilities takes into account such features as access to natural lighting, the possibility of admiring views of nature, the use of special materials in the room finish and color schemes that can contribute to the well-being of patients and their speedy recovery.

Thus, a functional planning method in the reconstruction and modernization of children's medical complexes is an integral part of successful work in this area.

Environmental method. This design method not only makes a positive contribution to the environment, considers the importance of creating and maintaining a favorable environment for children's health and development, but also contributes to the creation of sustainable and energy-efficient spaces. When it comes to children's healthcare facilities such as hospitals, outpatient clinics or rehabilitation centers, it is important to create an environment that promotes children's health and psychological well-being [8]. One of the key ideas behind the environmental method is to provide a safe and healthy environment. It means using environmentally friendly and safe building materials, ensuring proper ventilation and lighting of premises, creating a comfortable and safe environment for children's play and recreation. At the same time, the environmental method provides for the use of innovative technologies in construction, water collection and waste water systems, solar collectors, etc. All this together contributes to the creation of a friendly environment and reduces the negative impact.

In addition, an environmental method involves creating an environment that promotes the inclusion of children with disabilities. This may include accessible and adapted spaces, special equipment and technology, as well as staff training and special programs for the inclusion of children with special needs.

The medium method in architecture contributes to a healthier, more efficient and sustainable human environment. It combines the interests of people and nature in an effort to achieve harmony and balance in the modern world. In general, the use of the medium method in the reconstruction and modernization of children's medical complexes helps create a more effective and child-oriented environment for the treatment and rehabilitation of children. This contributes not only to the physical but also to the psychological well-being of children, which is an important aspect of their full development and recovery.

Compositional and artistic method. This method involves not only functional aspects, but also visual design that contributes to the psychological and emotional well-being of young patients. The main objective of the compositional-artistic method is to create harmonious and aesthetically attractive spaces in which children will feel comfortable and safe. An important part of this method is choosing the right color schemes that can have a positive impact on children's emotional well-being. It also includes careful thought and placement of elements to create a harmonious and aesthetically pleasing structure. Each detail and element should be placed in such a way that it fits in and emphasizes the overall appearance of the building.

It is also important to take into account the peculiarities of different age categories. Interiors designed to meet the needs and interests of children of different ages will help them feel comfortable and maintain a positive attitude towards treatment. The designer should strive to create thematic zones that promote the development of imagination and creative thinking of children. This can be a multimedia corner, playrooms, drawing and creativity zones. Such zones not only entertain children, but they can also play their part in psychological support and stress relief. In addition, a compositional and artistic method in the reconstruction and modernization of children's medical complexes helps create comfortable working conditions for medical staff. The organization of space, taking into account the specifics of work and the needs of specialists, helps to improve the efficiency and quality of care provided to children.

The main goal of the compositional-artistic method is to create a unique and comfortable environment that promotes positive emotional and psychological adaptation to the treatment process, as well as to improve the quality of work of the medical staff [9].

Scenario method. Modern architecture of medical centers is closely connected with the application of a scenario method in the process of their reconstruction. This method allows creating a harmonious combination of functionality, aesthetics and comfort, taking into account the basic needs and expectations of patients, staff and visitors. One of the key objectives of architectural renovation of buildings and structures of children's medical complexes is to create a comfortable, logical and efficient space capable of providing optimal conditions for prevention, treatment, recovery and communication. The scenario approach is reflected in the design of such a space, where all possible scenarios of the facility's use are taken into account. The key principles of the scenario method in the architecture of medical centers are flexibility, adaptability and multifunctionality. Flexibility implies the ability to quickly and efficiently reconfigure the space, depending on changing needs [7]. Adaptability allows the architecture to accommodate medical innovations, new technologies and equipment. Multifunctionality seeks to combine different functions and zones of the children's medical complex, ensuring maximum efficiency of space application.

When reconstructing the architecture of medical centers, the peculiarities of patients and staff are also taken into account. Cozy and comfortable rooms are created for patients, that promotes quick recovery and psychological well-being [9]. Special attention should be paid to the arrangement of playrooms, classrooms and recreation areas for children. They should be bright, ergonomic and varied to assist children in learning new skills, developing creative thinking and recovering from treatments. Specialized rooms for physical therapy and physiotherapy should also be provided. Comfortable and friendly designs will help to create a favorable atmosphere and reduce stress for young patients. Functional and ergonomic workspaces are provided for staff to help increase productivity and comfort during their work.

The scenario method in the reconstruction and modernization of children's medical complexes has great potential for creating comfortable and child-oriented medical facilities. This makes it possible to provide young patients with the best conditions for treatment and recovery, as well as to make the process of their stay in the hospital more pleasant and safe.

THE CONCLUSION

In the process of research, different architectural methods for creating a comfortable therapeutic environment of buildings and structures of children's medical centers have been identified and classified, which determines specific tasks and requirements for the reconstruction and modernization of these objects. It is proved that in the process of forming the architectural environment it is important to take into account the interests of users and the nature itself, in order to obtain a favorable result of interaction from nature to man in order to harmonize the architectural object. Theoretical and perspective architectural-typological models are developed, which allow better understanding functional and spatial aspects, as well as architectural and planning solutions necessary for the effective operation of children's medical institutions, based on the principle of ensuring safety, comfort and care for children.

Providing separate areas for different types of medical care, it is also important to provide a separate space for games and entertainment, which will help children forget about their illnesses and focus on positive emotions. To

create a comfortable atmosphere, it is also important to choose the right color scheme and interior design. Bright, vibrant colors can help create a joyful and playful mood, while cozy furniture and décor can help make the space more inviting and child-friendly. It is necessary to provide convenient ways of moving for children with disabilities, barrier-free access to the main rooms. The use of modern technologies and information systems can significantly improve the organization and quality of medical care.

It is necessary to conduct further in-depth analysis of architectural and urban planning, functional planning, composition and artistic solutions of children's medical centers in order to develop modern models of health care facilities with optimal functional links and flexible planning solutions in the conditions of reconstruction and modernization.

REFERENCES

1. Апханова, Н. С. Основы организации медицинской помощи детскому населению : учебное пособие / Н. С. Апханова, Е. В. Душина, А. В. Гашенко ; ФГБОУ ВО ИГМУ Минздрава России, Кафедра общественного здоровья и здравоохранения. – Иркутск : ИГМУ, 2020. – 68 с. – Текст : непосредственный.
2. Гайкова, Л. В. Исторический путь архитектурного развития лечебных зданий и комплексов / Л. В. Гайкова, Н. С. Родина. – Текст : непосредственный // Научный журнал СФУ. – 2018. – № 1(5). – С. 18–34.
3. Лисицин, Ю. П. История медицины / Ю. П. Лисицин. – 2-е издание переработанное и дополненное. – Москва : ГЭОТАР-Медиа, 2008. – 403 с. – Текст : непосредственный.
4. Радионов, Т. В. Разработка методологии архитектурно-градостроительной динамики, обеспечивающей реконструкцию жилых и общественных зданий сооружений / Т. В. Радионов. – Текст : непосредственный // Научно-технический и производственный журнал «Архитектура. Строительство. Образование». – 2018. – Выпуск 1 (11). – С. 96–102.
5. Синянский, И. А. Типология зданий / И. А. Синянский, Н. И. Манешина. – Москва : Академия, 2014. – 141 с. – Текст : непосредственный.
6. Чащина, А. И. Анализ современного состояния архитектурной среды родильных домов и перинатальных центров (на примере городов Юга России) / А. И. Чащина, А. В. Скопинцев. – Текст : непосредственный // Вестник БГТУ им. В. Г. Шухова. – 2020. – № 4. – С. 74–83.
7. Чеберова, О. Н. Принципы архитектурной модернизации комплексов медицинских соматических стационаров: на примере городских больниц Нижнего Новгорода : специальность 18.00.02 «Архитектура зданий и сооружений. Творческие концепции архитектурной деятельности» : автореферат диссертации на соискание ученой степени кандидата архитектуры / Чеберова Ольга Николаевна ; ННГАСУ. – Нижний Новгород, 2009. – 25 с. – Текст : непосредственный.
8. Шинкарев, А. Н. Анализ отечественного и зарубежного опыта в исследовании проектирования объектов здравоохранения / А. Н. Шинкарев, Е. И. Прокофьев. – Текст : непосредственный // Известия Казанского государственного архитектурно-строительного университета. – 2016. – № 3(37). – С. 82–92.
9. Югов, А. М. Модернизация комплексов и учреждений здравоохранения / А. М. Югов, Т. В. Радионов, С. А. Андреева. – Текст : электронный // Вестник Донбасской национальной академии строительства и архитектуры. – 2019. – Выпуск 2019-2(136) Проблемы архитектуры и градостроительства. – С. 54–59. – URL: [http://donnasa.ru/publish_house/journals/vestnik/2019/vestnik_2019-2\(136\).pdf](http://donnasa.ru/publish_house/journals/vestnik/2019/vestnik_2019-2(136).pdf) (дата обращения: 23.03.2024). – ISSN 2519-2817.

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 АРХИТЕКТУРНЫЕ ПРИЁМЫ ФОРМИРОВАНИЯ ДЕТСКИХ МЕДИЦИНСКИХ
 КОМПЛЕКСОВ В УСЛОВИЯХ РЕКОНСТРУКЦИИ
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Аннотация. Эволюция архитектуры медицинских зданий и сооружений ведет к формированию современного облика медицинских учреждений. Создание оптимальной лечебной среды напрямую зависит от архитектурно-планировочных, градостроительных особенностей, а также эксплуатационных факторов. Грамотно спроектированное здание, его расположение, внутреннее пространство и условия эксплуатации играют важную роль в обеспечении комфортной и эффективной медицинской помощи. Современные и инновационные подходы при реконструкции детских медицинских комплексов позволяют создавать уникальные и функциональные здания. Они способны значительно улучшить качество медицинской помощи, обеспечивать комфорт, как для пациентов, так и для медицинского персонала. При использовании передовых технологий, современных материалов и дизайнерских решений можно добиться оптимального сочетания эстетики, эффективности и безопасности. Профессиональный подход к реализации проектов по реконструкции

и модернизации медицинских учреждений играет ключевую роль в создании благоприятной среды для лечения и восстановления здоровья.

Ключевые слова: архитектура, реконструкция, модернизация, медицина, планировка, функциональность, адаптация.

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