

The role of the regional telemedicine center in the provision of medical care

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Material and methods. The study was carried out using a continuous method from 2020 to 2022. 13,444 cases of telemedicine consultations were analyzed, of which 2,296 were in relation to high-tech medical care for the population of the Samarkand region. The following methods were used: monographic, statistical, logical and system analysis. The work used absolute values, extensive indicators that model the structure, and methods for constructing time series with subsequent analysis.

Results. There is a significant increase in the number of teleconsultations of patients (from 1529 to 5759, 3.8 times) for the period from 2018 to 2020. At the federal level, the number of telemedicine consultations increased 6 times, from 208 in 2018 to 1265 in 2020. In 2020, the number of consultations organized regarding high-tech medical care decreased, which is associated with the repurposing of the region's leading medical institution into a specialized hospital for the treatment of patients with a new coronavirus infection and a sharp decrease in the number of consultations during restrictive measures.

Conclusions. Telemedicine technologies can provide patients with safer access to treatment, reduce the risk of medical errors and facilitate the early detection of health problems.

Key words: telemedicine, high-tech medical care, new coronavirus infection.

The rapid development of information, telecommunications and medical technologies creates the basis for the widespread introduction into medical practice of one of the fairly popular areas of organizing and providing medical care to the population both in Russia and abroad - telemedicine [1]. The main areas of use of telemedicine in practical healthcare: providing the opportunity to consult residents of remote areas with specialists from leading medical centers, meeting the growing need for organizing the most effective system of continuing medical education, as well as timely medical response in crisis situations. The emergence of a new coronavirus infection in 2020 confirmed the benefits of telecommunications technologies. According to A.V. Vladzimirsky et al ., in conditions of restrictive measures against the backdrop of a pandemic of a new coronavirus infection (Coronavirus Disease 2019, COVID -19) there is an increased demand for remote consultations [2]. During the pandemic, various areas of telemedicine began to develop dynamically and be introduced, which contributed to the transformation of the healthcare system as a whole. At the same time, some authors have critically assessed the capabilities of domestic telemedicine in the fight against COVID -19 [2, 3].

Reducing contact between patients and healthcare workers (“medical distancing”) is an important recommendation during the COVID -19 pandemic. As a result, the importance and impact of e-health has increased. Telemedicine has received a new impetus for development. It should be noted that the role of telemedicine in the treatment of infectious diseases was previously small, but in the situation with the spread of the new coronavirus infection, it has increased significantly [4]. Thanks to telemedicine, you can get advice at home. This has become convenient for residents of remote areas, and in the current epidemic situation, for most people. The most promising direction for the development of the Russian telemedicine system is the organization of teleconsultation centers in leading republican and regional medical institutions with their subsequent integration into a single telemedicine network [5]. Telemedicine technologies are used in the provision of specialized, including high-tech, medical care, as well as in resolving issues of hospitalization or transfer of patients to specialized institutions of the required profile with a higher level of equipment [1]. In order to justify the expansion of the telecommunications network in the Samarkand region, taking into account regional characteristics (the territorial location of individual areas), as well as due to the lack of research on the use of telemedicine technologies in crisis situations in the region and to assess their effectiveness directly in the context of the COVID -19 pandemic , this study.

The purpose of the study is to analyze the activities of the regional telemedicine center for the period from 2020 to 2022, including during the pandemic of the new coronavirus infection.

Material and methods

Professional videoconferencing equipment is additionally used to demonstrate on - line the progress of surgical interventions in the operating rooms of the surgical unit of the institution. Along with this, telemedicine support is provided for surgical conferences and master classes with interactive communication between operating specialists and the audience.

Some telemedicine center equipment is mobile, which makes it possible for telemedicine to be more mobile and provide consultations directly at the patient’s bedside.

The equipment is placed in such a way that it is possible to conduct both telemedicine events with large audiences (conferences, clinical discussions) and individual consultations (doctor-patient, doctor-doctor). The use of specialized software made it possible to further integrate a mobile clinic complex based on a KAMAZ vehicle into the system for providing teleconsultative care, which makes it possible to provide medical care to the rural population of the region.

The work used medical documentation data on the frequency of medical care provided to the population of the Samarkand region through telemedicine technologies. The observation period included 2020–2022. A continuous research

method was used, which included 13,444 cases of telemedicine consultations provided to the population of the Samarkand region, of which 2,296 were carried out in relation to high-tech medical care by federal institutions, 11,148 consultations by regional institutions. In addition, 407 tele-educational events were provided during the study period.

The study included a systematic search for information on the topic under study in scientific publications, conference and congress materials. To search for information, bibliographic references in articles were used. The key words for searching for the information necessary for the study were “telemedicine”, “telecommunication technologies”, “specialized medical care”, “high-tech medical care”. Articles found that matched the given words were initially reviewed, and if they had the necessary information for analysis, they were studied more specifically. The information received was systematized and summarized. For an in-depth study of the results of medical and statistical research, mathematical methods were used using the specialized statistical product Statistica 6.1, which includes a large number of statistical analysis methods.

The work used absolute values and statistical coefficients, namely extensive indicators that modulate the structure of the provision of telemedicine consultations. As necessary, well-known methods for calculating derivative values and methods for constructing time series were used: the absolute increase (decrease) was determined - the difference between the subsequent and previous levels; growth (decrease) rate - the percentage ratio of the absolute growth (decrease) of each subsequent level to the previous level; growth (decrease) rate - the percentage ratio of each subsequent level to the previous level; the absolute value of 1% growth (loss) is the ratio of absolute growth (loss) to the rate of growth (loss) for the same period of time.

results

The activities of the telemedicine center were carried out mainly in three main areas: organizing consultations, educational work, and solving administrative management problems. During the period under study, work continued on the development of a consultation network and the organization of teleconsultation in the regional segment: additionally connected institutions of the region of the second level of medical care, all city clinics serving children and adults, local hospitals and outpatient clinics in remote areas of the region with regular consultations both in the regional, and at the federal level. In 2020, the center carried out 1,183 consultations with patients from all medical organizations in the region, of which 203 were emergency, 74 emergency and 906 planned.

Providing coordination, organizational and technical assistance to medical organizations in the region in conducting all types of teleconsultations with federal medical centers and regional medical organizations is carried out through the administration and constant monitoring of the telemedicine information system. Over the past 3 years, there has been an increase in the number of consultations with

patients from all medical organizations in the region. Thus, at the federal level, both in the subsystem of telemedicine consultations of the Unified State Health Information System and in the Federal State Budgetary Institution "VTsMK" "Zashchita" FMBA, 208 consultations were carried out in 2020, in 2019 - already 823 (the growth rate was 395%), and in 2022 - 1265 (growth rate was 154%). It should be noted that all consultations carried out are related to the provision of specialized medical care, which is not possible to obtain within the region.

At the regional level, 1,321 consultations were held in 2018, 5,333 in 2019, an increase of more than 4 times. In 2020, 4,494 such consultations were held (a decrease of 84%). Similar dynamics can be seen when comparing all telemedicine consultations conducted at both the federal and regional levels (2018 - 1529, 2019 - 6156 and 2020 - 5759). The decrease in the number of telemedicine consultations in 2020 is due to the repurposing of the region's leading medical institution into a specialized infectious diseases hospital with the loss of most of the consultants' profiles and a sharp decrease in the number of consultations during restrictive measures.

Next, we analyzed the dynamics of consultations conducted by specialists of the State Budgetary Healthcare Institution JSC "AMOKB" using telemedicine technologies for patients of medical institutions in the region. The maximum absolute increase occurred in 2019 and amounted to 2,295 consultations compared to the previous year. In 2020, an absolute decrease was noted (-1808), which is directly related to the repurposing of the State Budgetary Healthcare Institution JSC "AMOKB" into a specialized hospital. The growth rate was the highest in 2020 and amounted to 1755.1%, and the decline rate in 2022 is 42.7%. As for the absolute value of the 1% increase, the maximum was in 2019 and amounted to 8.6 consultations and the minimum in 2018 was 0.49. The absolute value of 1% attrition in 2020 was 31.6 consultations (Table 3).

teleconsultations were conducted in the State Budgetary Healthcare Institution JSC "AMOKB" in 2019 ; in 2018 - 1030 (an increase of 15 times, which is associated with the initial connection to the telemedicine information system of the Ministry of Health and the creation of a regional system); in 2019 - 3979 (an overall increase of 3.8 times), including 1904 consultations based on the results of diagnostic studies with an increase of 7.3 times compared to the number of diagnostic telemedicine consultations in 2020; in 2022, 2,318 consultations were carried out - a decrease of 42%, which is due to the repurposing of the State Budgetary Healthcare Institution JSC "AMOKB" and the loss of consultants of most profiles, the downtime of the regional consultative and diagnostic center and a sharp decrease in the number of requests to the regional telemedicine system of the region during restrictive restrictions events.

Discussion

In the region during the study period, there was an increase in the number of teleconsultations both at the regional level (3.8 times) and at the federal level (6

times). A significant increase in indicators, especially the number of teleconsultations for patients in regional hospitals, is associated with the development of the regional telemedicine system. Consultations conducted by federal institutions are organized on the provision of specialized medical care, which is not provided at the regional level.

According to D.V. Vankova et al., highly specialized medical care is becoming available to the population of large cities and nearby settlements, while residents of remote areas experience difficulties even in obtaining specialized medical care, and this problem is global. A possible solution is to develop air ambulance and telemedicine.

In the Samarkand region, regular telemedicine provision of ophthalmological “Patient Schools” is carried out on various topics with broadcasts to regional hospitals. According to a number of authors, teleophthalmology (TO) is an important area of telemedicine, which includes a number of areas, the main of which is remote diagnosis, treatment and management of patients with ophthalmological diseases. The development of healthcare is due to the need to provide high-tech specialized medical care to the population of remote regions [7].

During the restrictive measures, weekly training seminars were held on methods for preventing the spread of the new coronavirus infection, as well as on the features of treating this pathology. They contributed to increasing the level of awareness of medical personnel in the Samarkand region. In turn, according to M.A. Korableva, the prospects for the development of telemedicine in general include professional training, legal and insurance protection for telemedicine doctors, ensuring the protection of patient data using the latest technologies, and the possibility of conducting research using non-contact methods [8].

In 2020, in the Samarkand region, the number of consultations related to high-tech medical care decreased, which is explained by the repurposing of the region’s leading medical institution into a specialized hospital for the treatment of patients with a new coronavirus infection and a sharp decrease in the total number of consultations during restrictive measures.

According to V.A. Petlakh and E.A Okulova, one of the most important aspects of the use of telecommunication technologies is the possibility of continuous training of hospital doctors in the subjects of the healthcare system, which allows access to the development of new methods of diagnosis and treatment of diseases included in the list of types of high-tech medical care, and improve the organization of medical care assistance in the regions [9]. Thus, the use of modern telemedicine helps to increase the efficiency of providing high-tech medical care in the regions, increases the level of qualifications of local specialists, and leads to savings in the regional budget [10].

Despite the fact that the study was conducted using a continuous method and used data from official reporting forms, which took into account all cases of

telemedicine consultations, there are some limitations. Medical organizations of various KM subjects are unevenly provided with telecommunication technologies, and at the same time, there is a limitation in the possibility of conducting telemedicine consultations not only with leading KM centers, but also within the region. This leads to uneven use of these technologies in different regions.

Conclusion

The following regional features of the provision of telemedicine consultations have been identified:

— a significant increase in indicators, especially the number of teleconsultations for patients in district hospitals, is associated with the development of the regional telemedicine system and the expansion of horizontal connections between branches, with the coordinating role and organizational and technical support of the teleconsultation process in the region by the center, as well as with the constant development of infocommunication technologies and an increase in the level of general informatization of healthcare in the region;

— the main results of telemedicine consultations are clarification or change of disease diagnoses, as well as correction of treatment tactics;

— the rapid development of telecommunications, as well as the reduction in the cost of communication services, leads to the widespread use of video conferencing aimed at conducting educational, scientific and administrative events;

— the need to maintain in working order and widespread development of telecommunication technologies that have shown their effectiveness in crisis situations is urgent, to expand the possibilities of their use, especially for residents of remote areas.

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