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PROBLEMATIC ISSUES OF INFORMATION SUPPORT FOR MANAGEMENT DECISION-MAKING IN HEALTHCARE

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ABSTRACT — The purpose of the work is to analyze the main problem areas and the possibilities of introducing an information support system for making management decisions (controlling) in the activities of managers of modern medical organizations. The work used bibliographic, descriptive-analytical, general scientific, methods of system and content analysis. As a result of the study, the prospects for the use of controlling tools in preventive and clinical medicine, including in activities directly related to the treatment of patients, have been substantiated; a number of indicators have been proposed for monitoring and assessing the health status of the population; an assessment was made of the possibilities of using the decision-making information support system in the management of a medical organization; the main directions of further implementation of IT-technologies in healthcare practice are presented. The results obtained in the course of the study will significantly improve the quality of management decisions made and the effectiveness of the activities of modern medical organizations.

KEYWORDS — healthcare; information technology; controlling; clinical medicine, preventive medicine, management decisions.

INTRODUCTION

In a market economy, medical organizations are forced to participate in fierce competition for government orders, access to healthcare funds and the sector of paid services. Therefore, today the problem of introducing innovative technologies into the management system of organizations in order to increase the efficiency of their activities comes to the fore and becomes more and more urgent. Increasing the duration of a person's active life also requires significant investments in the development of the health care system, including in the training of highly qualified personnel, the introduction of innovative high-tech solutions based on the use of modern IT technologies in support

systems and in making clinical and management decisions. Despite the fact that health care expenditures are very heterogeneous around the world, it should be noted that the relationship between health care expenditures and public health indicators is not always direct. In this case, the key indicators are traditionally life expectancy, that is, the average age at death from all causes, and the infant mortality rate per 100,000 newborns, in other words, the number of children under 1 year of age per 100,000 births [9]. World Bank data are indicative and suggest that increases in health spending are not necessarily proportional to improvements in the quality of health care delivery. For example, when in the United States health care costs exceeded 8 thousand conventional units per person, and the average life expectancy approached 80 years, Japan, Portugal, Slovenia, Italy exceeded this bar at half the cost [1].

A significant contribution to this situation is made by the peculiarities of the geographical location of countries, mentality and a number of other reasons, however, the key factor, especially with life expectancy above the average level, is the efficiency of the health care system.

The COVID-19 pandemic and syndemia, the mutual course of a new coronavirus infection and a number of non-communicable diseases, such as diabetes mellitus, kidney and cardiovascular diseases, which worsen the prognosis and aggravate the course of diseases, have revealed a number of significant deficiencies in the health care system, one of which is the absence of a harmonious system of information support for making clinical and managerial decisions (controlling), which allows you to quickly receive timely and reliable information, both in individual medical organizations and at various levels of management of the health care system as a whole. Taking into account the limited funding for health care, as well as the increased burden on medical organizations in the context of the ongoing pandemic of the new coronavirus infection, the urgency of the problem of increasing the efficiency of the health care system, the effectiveness of management in health care is constantly increasing. One of the most promising ways to improve the efficiency of management is its information support, which makes the task of organizing a support system for making effective management decisions, wider implementation

of the controlling system and its corresponding tools in the activities of medical organizations, the so-called «medical controlling» [3, 4, 12].

METHODS

To achieve the goal set in the work, the following methods were used: bibliographic, descriptive-analytical, general scientific (analysis, synthesis, generalization), methods of system and content analysis.

RESULTS AND DISCUSSION

Controlling in clinical medicine

In the conditions of market relations and insurance medicine, controlling has serious prospects for implementation in healthcare practice, both at the level of management of structural and functional units and medical organizations in general (offices, departments, institutions, a network of institutions), and at the level of administrative-territorial units. At the same time, in various types of medical organizations, controlling tools can provide significant support in the work of both managers (heads of departments, chief physicians and their deputies, chief nurse) and attending physicians who are directly involved in the process of treating patients.

In each case, controlling will allow monitoring the indicators characterizing the patient's health (levels of temperature, saturation, blood pressure, heart rate, blood glucose, glycemic index, etc.). The monitoring and analysis system of these parameters can be considered as a controlling system, since it corresponds to its functions and tasks [5].

One of the main goals of the management of a medical organization — control over the expenditure of all types of resources — is successfully solved by controlling tools, while the powers of the head of a healthcare institution (chief doctors of hospitals, outpatient centers, etc.) economic independence, increasing the efficiency of controlling becomes more and more urgent [7].

Various medical and laboratory information systems (MIS and LIS, respectively), successfully introduced and actively used today in clinical practice [2], have become a specific tool for controlling in health care, allowing to streamline the distribution of the incoming flow of patients, eliminate queues for appointments to doctors, rationally plan the workload of laboratories, effectively use the existing funds of organizations, including beds, assess the quality of work of specific employees of the organization for the implementation of a differentiated system of incentives for employees, depending on the quality of their work.

Controlling in the tasks of the healthcare organization

An equally important aspect of the application of controlling in health care is the use of its basic principles in the organization of the health care system of citizens.

As an IT tool at the level of the healthcare organization, it is necessary to bring clinical registers, which are from a technical point of view a medical information system, however, organized according to the principle of «all patients with a specific disease / condition in a certain territory» (region, country as a whole), as opposed to MIS, organized according to the principle «all patients of a particular health care institution with their diseases» [11].

We consider it expedient to single out today a number of indicators by which one can judge the state of health of the population in a particular territory. In the event that we ensure monitoring of the state of such indicators, which allow the relevant managers and governing bodies to make informed decisions, we can state the fact of the implementation of the controlling system in practice. In addition to the already mentioned life expectancy, maternal and infant mortality, it is advisable to include the following indicators among such indicators:

- The number of medical personnel (doctors, nurses) per population unit (a particularly important indicator of the overloading of the healthcare system, typical for work in the context of the Covid-19 pandemic);
- Number of beds in day hospitals and in hospitals around the clock;
- Share of government spending on health care;
- Mortality from all causes in the context of age categories of the population (including by region — the indicator allows you to find the most «problem» nosological forms);
- The incidence rate of the population, especially socially significant diseases;
- Tracking all processes occurring in medical organizations in real time and comparing target results with those achieved;
- Postoperative complications and postoperative mortality;
- Maternal mortality rate (characterizes the quality of obstetric and gynecological medical care);
- The prevalence of HIV infection;
- The proportion of infected pregnant women receiving antiretroviral drugs (an important indicator of both the prevalence of HIV and the likelihood of having a healthy baby from an HIV-positive mother);
- Morbidity and mortality from malignant neoplasms in the context of regions;

— The number of deaths caused by certain types of malignant neoplasms (allows to assess the quality of cancer care for the population).

In our opinion, important indicators at the population level are indicators of the «burden of disease» and «cost of disease».

«Burden of disease» is a group of indicators characterizing the economic damage from morbidity (6). The main indicators of the «burden of disease» are:

— years of life lost due to premature mortality (years of life lost, YLL: years not reached the value of life expectancy);

— years of life with disability (years lost due to disability, YLD — time of life lived with disability due to illness and injury);

— years of life adjusted for disability (disability-adjusted life years, DALY: sum of YLL and YLD);

— healthy life expectancy (HALE: analogous to life expectancy minus DALYs).

At the moment, the international scientific partnership in the field of the global burden of disease, injury and risk factors, which includes the authors of this article, is monitoring the values of these indicators for different countries and territories (in particular, for a number of countries, the indicators are detailed to the level of administrative-territorial units the first level — the states of the United States, regions of England, regions of Russia, etc.).

As a subjective criterion for assessing one's own health, it is advisable to use the QALY (Quality-adjusted life-years) indicator, which characterizes the quality of life of patients and is assessed based on the use of a unified questionnaire. Due to the difficulties in collecting relevant information, a specialized study to assess the QALY in Russia was implemented only relatively recently [8].

The values of the listed synthetic indicators are important for the effective organization (reorganization) of the healthcare delivery system - these parameters, especially in the aspect of comparative assessment of the values of indicators in different regions, must be used by the executive authorities of different countries, as well as at the international level (on the scale of the World Health Organization).

If the indicators of the «burden of disease» demonstrate temporal characteristics, then the «cost of diseases» is characterized by financial indicators reflecting the monetary costs of treating a particular nosological form, including both the real costs of organizing medical care and lost profits in the economy as a result of disability and its reduction. However, despite the detailed assessment, such a study is extremely time consuming.

A truly realizing in practice the controlling system today allows the transition from the global to the local burden of disease, when the decision-maker has not just aggregated data, but the values of the most important indicators, «tied» to real medical organizations or regions [10]. As the «resolving power» of the method grows, it becomes possible to take specific measures on a specific territory, which is relevant both at the local level and at the level of global organizations (for example, international organizations can plan targeted humanitarian missions) [13].

The analysis showed that at the moment in the Russian health care system as a whole, one can state the lack of specific controlling tools that take into account its specifics. At the same time, it seems logical that they should provide monitoring of indicators that are most consistent with indicators used (or potentially applicable) in the tasks of clinical medicine (as a criterion for the effectiveness of a particular product in a particular case) and healthcare organization (as a criterion for the effectiveness of a product in principle).

The introduction of individual elements of the controlling system into the activities of modern organizations already in itself increases the efficiency of management and facilitates their interaction at all levels, thereby contributing to survival in the turbulent world of market relations. However, it is possible to further increase the efficiency of their activities due to the transition from the use of individual elements to a full-fledged controlling system (a subsystem in the management system of a medical organization), which makes it possible to successfully implement innovative projects in the field of healthcare.

CONCLUSION

Thus, today all spheres of human activity, including the sphere of health protection, are significantly transformed under the influence of information technologies, widely using controlling tools, which not only simplifies communication, but also provides control over the state of indicators that allow predicting situations, taking optimal and timely management and clinical decisions.

In the conditions of a market economy, the emergence of economic independence for the subjects, the growth of competition, the need to increase the efficiency of management increases, which is impossible in the absence of reliable information support.

The development and implementation of an automated monitoring system for the indicators proposed by the authors, their use in the tasks of increasing the efficiency of management of medical organizations and the health care system as a whole, can be considered elements of controlling. In view of

the digital transformation of all spheres of activity, it is already possible to state the presence of elements of the controlling system in management practice, for example, IT solutions for personnel accounting, the movement of financial flows and material resources. Such solutions not only allow improving the efficiency of management and interaction, today they have become an integral part of professional human activity. A qualitatively new result will be achieved both by the integration of individual elements into a full-fledged controlling system of an economic entity (start-up, organization, medical institution), and by the creation of a unified controlling system for the health care sector as a whole.

Providing information and analytical support for the management process, controlling provides significant assistance to the head of a modern medical organization in the process of implementing all types of planning of its activities, coordinating the work of structural and functional units, analyzing the main indicators of the institution as a whole and its individual units, assessing the availability and quality of services provided to patients medical care.

Thus, controlling today should be focused on the continuous improvement of a unified system for managing medical activities in terms of coordinating the development and achievement of the set goals. It should ensure, at all stages of the management cycle, the integration and coordination of the functioning of systems and processes based on standard procedures. When organizing and building controlling, it is necessary to strive to ensure that its information base is provided by a unified information system that works according to general rules for all subjects of the healthcare management system.

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