

Quality Management System in Medical Organizations as a Tool to Increase Human Satisfaction with Services

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Abstract — The study focuses on the correlation between the quality management system in medical organizations, the quality of medical services and human satisfaction with them. The decline in the medical aid quality and accessibility portrays itself as challenges and threats to the economic stability. The quality management system (QMS) is regarded as a tool to improve the quality of medical services and human satisfaction. As it is known, the quality management is a coordinated organization management in terms of quality, which consists of sequential actions including, first of all, the development of policies and goals in the context of quality, as well as planning, direct management, ensuring quality and improving it. The internal quality control system is considered a QMS model option in compliance with Roszdravnadzor recommendations. It includes the main processes: eleven for in-patient departments and fifteen for outpatient clinics. Each process has groups of indicators, formed ways and methods of assessing them. Work processes are regulated by standard operating procedures, which are documented instructions to perform work procedures. In 2016, six Russian Federation constituent territories participated in the internal quality control management, in 2017 – sixteen including the Tyumen region. In 2018, Tyumen Outpatient Clinics No. 5 and 17 were the first ones in the country to obtain Roszdravnadzor compliance certificate with certification procedure for medical organizations on a voluntary basis. The main target indicator of "Health Care" National Project is life expectancy, and the quantitative indicator of the internal quality control system is the population morbidity rate. The conducted econometric analysis showed that all healthcare factors with a positive influence vector were significant causes for changes in the morbidity rate per 1000 people. When assessing the impact on the possible life expectancy at birth, the following factors were significant: the capacity of outpatient clinics, the ratio of doctors and nurses (with a positive influence vector), the availability of hospital beds per 10,000 people (with a negative influence vector). The human satisfaction with the quality of medical aid was assessed by analyzing indicators at the official website for posting information on state (municipal) institutions, sample surveys of Rosstat and medical insurance institutions as part of "Health Care" National Project. The assessment results of the population

satisfaction with the medical aid quality revealed a number of shortcomings in the work of medical organizations, which will be solved by implementing the QMS.

Keywords — quality management, internal quality control, quality of medical services, accessibility of medical services, human satisfaction with services, life expectancy, population morbidity rate.

I. INTRODUCTION

Currently, the issues of the quality of medical services and human satisfaction with them are particularly relevant because, ultimately, they are the factors to optimize the country's economy and its further development.

By the Russian Federation President Decree of May 13, 2017, No. 208 "On the Strategy for Economic Security of the Russian Federation for the period up to 2030", the decrease in the medical aid quality and accessibility is defined as the main challenge and threat to the economic stability.

Since the beginning of 2019, "Health Care" National Project has been implemented in Russia. It includes the improvement of primary health care, and the training of medical specialists for cardiovascular and oncological diseases, the digitalization of healthcare, the development of healthcare for children, the development of national medical centers and medical tourism. The project objective is to increase life expectancy at birth up to 78 years by 2024 (up to 80 years by 2030).

The analysis of statistical data for the Tyumen region showed that over the last 5 years there has been a positive trend in the key indicators. Thus, there was a 4.3 % decrease in morbidity per 1,000 people, and a 13.5 % decrease in working age mortality. In terms of mortality rate, including circulatory diseases and neoplasms, the region has reached the values below the target indicators of the state program and actual indicators for the Russian Federation. A 39 % decrease

in infant mortality, and a 2.7 % increase in overall life expectancy are also observed.

A powerful tool to improve the quality of medical services and human satisfaction with them is the functioning of the organization quality management system.

The 2020 Concept for the Development of Health Care of the Russian Federation states that more than 95 % of medical organizations should introduce the QMS into practice.

The purpose of this study is to assess the correlation between the quality management system in medical organizations, the quality of medical services and population satisfaction.

This purpose can be achieved with consistently solved objectives. First, the quality management system in medical organizations and the process of its implementation are evaluated. Next, the correlation between the national project and internal quality control system targets with healthcare organization factors is analyzed. The ultimate objective of the study is to analyze human satisfaction with the medical aid quality.

II. LITERATURE REVIEW

A priority in the Russian national security and health development strategies is to provide a high-quality, accessible and timely medical aid [1], [2]. The implementation of these strategies is aimed at improving the quality of population life, preserving the nation health, increasing life expectancy [3], [4]. Yu.V. Emanuel, A.L. Khotin research the possibility to enhance the healthcare organization efficiency by implementing a quality management system based on ISO 9000 international standards requirements [5]. E.V. Manukhina and G.B. Artemyeva also mention a significant role of competent management in the work organization of medical institutions and its impact on the healthcare social and economic efficiency [6].

L.M. Lapina and S.M. Serdyukovsky emphasize the need for medical activity legal regulation, which contributes to the proper quality control of medical services [7]. In his work A.D. Bugaev notes that an efficient tool to develop the service quality management system is handling citizens' complaints regarding the delivery of medical aid. The author conducted a study on the traumatologic and orthopedic care for patients, and he states that up to 46 % of such complaints are valid [8].

N.V. Sazonova, E.N. Ovchinnikov et al. examined the cases of implementing a quality management system in Ilizarov Center. The authors note that the process approach implementation contributed to the increased accessibility, patient's satisfaction, and organization increased efficiency [9].

N.V. Kungurov, N.V. Silberberg et al. identify the factors that have a negative impact on the quality of hospital dermatovenerological care and developed suggestions on implementing an automated information system, enabling a continuous monitoring of the patients and of the service quality level [10].

III. METHODS AND MATERIALS

The research materials for this theme are scientific literature, statistical data and independent assessment results of the quality of services provided by medical organizations (<https://bus.gov.ru>) and of the questionnaire conducted by insurance organizations of the Tyumen region as part of "Health Care" National Project, Rosstat surveys (<https://gks.ru>).

The authors chose the following research methods as the analysis of scientific literature on the QMS in medical organizations, the medical service quality and satisfaction with them; the econometric analysis in Gretl and Stata software packages; the graphical approach enabling the visualization of the study main aspects; the content analysis, the subject of which was the content of text blocks.

IV. RESULTS

Until recently, there was no unified system of the quality control and safety of health care in our country.

The standardization with the use of national standards for medical activity quality management has been continuously used in most developed countries, for instance, in the United States – by the Agency for Healthcare Research and Quality (AHRQ), Canada – the Canadian Institute for Health Information (CIHI), Australia – the Australian Institute of Health and Welfare, Australian Commission on Safety and Quality in Health Care, Great Britain – the National Institute for Health and Care Excellence (NICE), Accreditation Advisory Committee.

The medical aid quality categories used in the developed countries are as follows: safety, effectiveness, patient-oriented approach, accessibility, and efficiency 0.

There is an active paradigm shift from control to management, and quality and safety assurance in the Russian Federation.

Federal Law No. 162-FZ “On the Standardization in the Russian Federation” stipulates basic standardization concepts, objects, and applicable documentation.

The standardization levels in the medical activity quality management are given below (Figure 01).

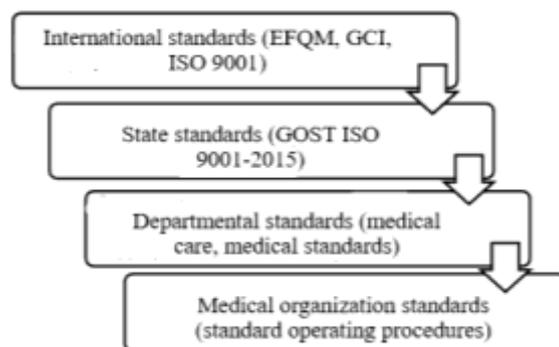


Fig. 1. Standardization levels in the medical activity quality management

GOST ISO 9000-2011 “Quality Management Systems Fundamentals” defines the quality management as a coordinated activity on organization management as applied to quality, including the development of quality policies and goals, quality planning, quality management, quality assurance, and quality improvement.

The internal quality control in compliance with Roszdravnadzor recommendations can be considered as a QMS model option, which includes the main processes, for in-patient departments as follows:

1. Personnel management. Medical personnel.
2. Patient identification.
3. Epidemiological safety /Prevention of infections associated with the delivery of medical aid.
4. Drug safety.
5. Ensuring the quality and safety of medical devices.
6. Emergency care management.
7. Continuity of care (transfer of responsibility on behalf of a patient).
8. Surgical safety/prevention of risks associated with surgical interventions.
9. Prevention of risks associated with blood transfusions.
10. Environmental safety.
11. Providing evidence-based healthcare.

The list of main processes is slightly different for outpatient clinics, additionally to those described above (excluding clause 9), it includes:

1. Front desk work organization.
2. Inpatient replacement technologies (day patient department, “home care” work organization).
3. Periodic health examination of insured patients.
4. Dispensary observation of chronic patients.
5. Organization of preventive work. Formation of healthy lifestyle among the population.

The groups of indicators are defined for each process. First, they are evaluated separately, next – by section, and then – by organization. The safety assessment criteria (Table 01) are listed below.

TABLE I. SAFETY SCALE OF A MEDICAL ORGANIZATION IN THE QMS

Total score for each section, %	Safety assessment
More than 80 %	The system is safe
70–80 %	The system is relatively safe
Less than 70 %	The system is not safe

The medical organization activity is considered safe if more than 80 % is within the requirements of voluntary Roszdravnadzor medical organizations certification, “Quality and Safety of Medical Activity”.

In 2016, six Russian Federation constituent territories participated in the implementation of “Proposals (Practical Recommendations) on the internal quality control management and safety of medical activities in a medical organization”, in 2017 – sixteen including the Tyumen region. In August 2018, Tyumen Outpatient Clinics No. 5 and 17 were the first ones in the country to obtain the certificates. At the end of 2018, Rozdravnadzor Commission conducted an external audit, per the results of which a compliance certificate was issued to seven Tyumen Outpatient Clinics No. 5, 17, 8, 12, 1, 14, and 3; in 2019 – to Outpatient Polyclinic Department of Regional Clinic Hospital No. 2, Dermatovenerologic Dispensary. Tyumen Regional Clinic Hospital No. 1 was included in the top ten Russian multidisciplinary clinics that received “Quality and Safety of Medical Activity” Certificate. In February 2020, In-patient Department of the Tyumen Regional Clinical Psychiatric Hospital became the first specialized institution in Russia to obtain a quality certificate from Roszdravnadzor.

Studying the correlation between life expectancy at birth as a main indicator of “Health Care” National Project, the population morbidity rate as a quantitative indicator of the internal control of the medical activity quality and the following healthcare organization factors is relevant within the framework of this study:

- the availability of hospital beds per 10,000 people (availab_hosp);
- the capacity of outpatient clinics (at the end of the year; visits per shift) (power_clinics);
- the number of doctors per 10,000 people (at the end of the year; people) (doctors_popular);
- the ratio of doctors and nurses (doc_midlevel).

The data from the Federal State Statistics Service on the Russian Federation territorial constituents for the period from 1995 to 2017 was used for this study.

Using the econometric analysis in Gretl and Stata software packages, statistically significant indicators were selected and proved in the group of healthcare organization factors in terms of their impact on morbidity rate (logarithm) and life expectancy at birth (logarithm).

The model with fixed effects was chosen as the main econometric model; while evaluating the equations, heteroskedasticity corrections were made using the robust standard error function, and satisfactory model specification tests were conducted (Ramsey, Hausman tests).

The equation assessment results of morbidity rate regression and life expectancy at birth in the Russian Federation territorial constituents versus healthcare characteristics in 1995–2017 are shown below (Table 02).

As a result, all healthcare factors with a positive influence vector were significant causes for the changes in the morbidity rate per 1000 people.

During the assessment of the impact on life expectancy at birth from a healthcare perspective, 3 factors were significant:

the capacity of outpatient clinics at the end of the year (visits per shift), the ratio of doctors and nurses (with a positive influence vector), the availability of hospital beds per 10,000 people (at the end of the year) (with a negative influence vector). Other healthcare factors were not specified as significant.

TABLE II. EQUATION ASSESSMENT RESULTS OF MORBIDITY RATE REGRESSION AND LIFE EXPECTANCY AT BIRTH IN THE RUSSIAN FEDERATION TERRITORIAL CONSTITUENTS VERSUS HEALTHCARE CHARACTERISTICS IN 1995-2017

<i>Cause variable</i>	Dependent variable: morbidity rate (logarithm) (1)	Dependent variable: life expectancy at birth (logarithm) (2)
Const	5,437***(0,31)	3,793***(0,12)
l_power_clinics	0,336***(0,072)	0,16***(0,03)
doc_midlevel		0,000239860 *** (6,50679 e-05)
available_hosp		-0,00130900 *** (0,000193227)
sq_availab_hosp	-0,0000136*** (1,74073e-06)	
sq_doc_midlevel	0,0000154 *** (4,39266e-06)	
available_hosp_doctors_popular	0,00003*** (6,73e-06)	
Regression standard error	0,11	0,027
R ² (cor. R ²)	0,695 (0,21)	0,76 (0,54)
Number of observations	1817	1817

One of the target indicators of the healthcare development state program is the population satisfaction with the medical aid quality, which can be currently implemented through:

1. The analysis of independent assessment results of the service quality at the official website for posting information on state (municipal) institutions. The assessment criteria are hospitability, comfort, waiting time, friendliness and satisfaction.
2. Rosstat sample surveys.
3. Population sample surveys in the form of questionnaires conducted by medical insurance institutions as part of "Health Care" National Project.

The top rating of the Russian Federation territorial constituents in the health care was determined in the process of assessing the degree of patient's satisfaction with its quality in 2015–2017 on the basis of the independent score assessment results of the quality of services provided by medical organizations in outpatient settings, based on sample surveys of service consumers. According to the rating, the Tyumen region was ranked 52nd in 2015 and moved up to 32nd in 2017.

The analysis of Rosstat sample data of household surveys for 2015 and 2017 from the perspective of Russian territorial constituents showed an increase in the level of satisfaction with the work of outpatient clinics in the Tyumen region in 2017 from 42.3 % to 50.7 % compared to 2015. In 2015, the

biggest dissatisfaction was mostly caused by the following factors: waiting time in queues (79.6 %), absence of necessary equipment (42.6 %), waiting conditions (41.9 %). In 2017, the causes of the biggest dissatisfaction were as follows: waiting times in queues (61.9 %), doctors' work (35.4 %) and waiting conditions (30 %).

In the population sample survey conducted by medical insurance companies of the Tyumen region in 2018–2019, 1511 respondents were surveyed, including 33.6 % of men and 66.4 % of women in the following age categories: children – 4.7 %; 18–39 years – 43.5 %, 40–59 years – 32.8 % and 60 years and older – 19 %. The population satisfaction with the medical aid in the outpatient-polyclinic sector was assessed by the following aspects and on the following level:

- appointment waiting time at the general practitioner's office (whether the appointment started on time or not) – 34.8 %,
- doctor's attitude during the appointment – 50.8 %,
- the result of the general practitioner's appointment – 49.4 %,
- taking periodic health examinations and/or preventive examinations – 33.7 %.

All these points prove the importance of strengthening the outpatient-polyclinic sector in terms of early disease detection, subsequent timely and efficient treatment, which leads to an increase in life expectancy at birth, in part through the implementation of the quality management system in medical organizations.

V. CONCLUSION

The assessment results of human satisfaction with the medical aid quality have revealed a number of shortcomings in the work of medical organizations, which can be solved by implementing the quality management system.

As it is shown in the surveys, the satisfaction with waiting time and conditions at the doctor's office appears to be one of the negative factors in the process of medical service provision every year. It usually relates to the disruption of organizational processes. The QMS procedure also involves using lean manufacturing elements (Lean technologies), which include:

1. Improving the patient routing and logistics system by controlling and adjusting flows of different categories.
2. Ensuring an equal capacity for doctors, medical personnel and front desk.
3. Convenient ergonomics of the medical personnel workplace, which results in less time spent on regular work processes (doing paperwork, using a computer and working directly with a patient).
4. Electronic flow of documents, which should also lead to an increased data processing rate.
5. Personnel work optimization through eliminating time losses resulting in additional reports, unnecessary employee actions, waiting time, excessive processing of information, correcting documentation errors, etc.

All these working procedures can be both regulated by separate standard operating procedures and by a system algorithm, which the QMS is based on as applicable to the medical organization specifics.

According to the surveys, less than half of the population is satisfied with doctor's work and the attitude of the general practitioner during the appointment. According to WHO recommendations, when assessing the efficiency of healthcare systems, the "healthcare system responsiveness" factor should be evaluated, and it includes the two main aspects:

1. The individual respect (dignity, confidentiality, etc.).
2. Attention to a patient (support speed, service time, quality of conditions, choice of service provider).

Subsequently, this problem can be partially solved by implementing lean technologies, which are the QMC integral part. The second step in resolving this issue is to strengthen the control over medical personnel in relation to ethics and deontology that is stipulated by the principal federal laws regulating medical activities (FZ-323, FZ-326), Federal Compulsory Medical Insurance Fund orders and other regulations. After all, medical services are often considered as "negative services", i.e. those that a healthy person is not willing to use, thus, the relations between medical personnel and the patient cannot be based on equality of parties, which is the principle of civil law. In this regard, the satisfaction with a medical service cannot always be assessed reasonably by the patient as the value of health and high-quality life is incomparable to any well-known spiritual and material wealth.

Therefore, the active implementation of the quality management system in medical organizations should ensure the achievement of target objectives of the state and regional healthcare development programs.

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