

A COMPARATIVE ANALYSIS OF PERFORMANCE INDICATORS FROM THE SURGICAL DEPARTMENT OF A MULTIDISCIPLINARY HOSPITAL IN DYNAMIC OVER 5 YEARS (2017-2021)

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Abstract

Many countries have actively implemented reforms over the last two decades to increase the productivity of their healthcare systems and the effectiveness of treatment and prevention activities. And the classical indicators of hospital performance such as the use of hospital beds and the quality of hospital care are the main indicators of good management in a hospital.

Material and methods. The object of the study is the medical and statistical performance indicators of the surgical department and the surgical day hospital of the multidisciplinary hospital in Almaty for 5 years (2017–2021). As a source of information, an electronic database of the statistical department of the hospital was used. Medical statistical analysis was applied as a method of study. This type of study is a cross-sectional study based on a retrospective descriptive analysis of official statistics.

Results. In terms of dynamics, the structure of those treated in the surgical department does not change. However, there is a significant decrease in the amount of planned surgical pathology compared to the slight drop in hospitalization (a decrease of -40%), possibly due to a decrease in the volume of government orders (a decrease of -43.4%). Within the framework of the state order, the indicator of the average length of stay of a patient in a hospital, in general, tends to decrease from 8,5 in 2017 to 8,2 in 2021. A higher level of surgical activity in the surgical department (76,4% vs. 62,6% in surgical departments in 2021), a lower postoperative complication rate (0,2% vs. 0,3%), and a lower postoperative mortality (0,7% vs. 1,1%) were stated as positive indicators of surgical service. In 2021, the frequency of emergency operations in the surgical department was roughly the same, at 19,1%; the total share of outpatient surgery (for all profiles) in the structure of all surgery was 11,3%.

Conclusion. The identified deterioration in the use of hospital beds in the surgical department (decrease in bed turnover, increase in the average duration of one case of hospitalization, decrease in the planned number of bed days) requires improvement of the planning and control system for hospitalization. Perhaps this problem is relevant for many multidisciplinary hospitals.

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indicators, surgical department, multidisciplinary hospital, outpatient surgery.

Көп бейінді аурухананың хирургиялық бөлімшесінің 5 жылдағы динамикадағы көрсеткіштерін салыстырмалы талдау (2017-2021 ж.)

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Аңдатпа

Соңғы екі онжылдықта көптеген елдер денсаулық сақтау жүйесінің өнімділігін арттыруға және емдеу-профилактикалық іс-шаралардың тиімділігін арттыруға бағытталған реформаларды белсенді түрде жүзеге асыруда. Ал стационардағы дұрыс басқарудың негізгі көрсеткіштері аурухана жұмысының классикалық көрсеткіштері, аурухана төсек-орындарын пайдалану және стационарлық көмек көрсету сапасы болып табылады.

Материал және әдістері. Зерттеу нысаны – Алматы қаласындағы көпсалалы аурухананың хирургиялық бөлімшесі мен күндізгі хирургиялық стационардың 5 жылдағы (2017-2021 жж.)

Мүдделер қақтығысы:
Авторлар мүдделер қақтығысының жоқтығын мәлімдейді

Түйінді сөздер: көрсеткіштер, хирургиялық бөлім, көпсалалы стационар, амбулаториялық хирургия.

медициналық-статистикалық нәтижелік көрсеткіштері. Ақпарат көздері ретінде аурухананың статистикалық бөлімінің электронды базасы пайдаланылды. Медициналық статистикалық талдаудың қолданылатын әдістері. Зерттеу түрі: ресми статистиканың ретроспективті сипаттамалық талдауына негізделген қималық зерттеу.

Нәтижелері. Динамикадағы хирургиялық бөлімде емделгендердің құрылымы өзгермейді. Бірақ стационарға жатқызу деңгейінің шамалы төмендеуі аясында жоспарлы хирургиялық патология жиілігінің күрт төмендеуі байқалады (кему -40% 0), мүмкін мемлекеттік тапсырыс көлемінің азаюына байланысты (кему -43,4% 0). Мемлекеттік тапсырыс шеңберінде науқастың стационарда болуының орташа ұзақтығы көрсеткіші, жалпы алғанда, 2017 жылғы 8,5-тен 2021 жылы 8,2-ге дейін төмендеуі үрдісіне ие. Хирургиялық жұмыстың жақсы көрсеткіштері атап өтілді: хирургиялық бөлімшеде хирургиялық белсенділіктің жоғары деңгейі (2021 жылы хирургиялық профиль бөлімшелерінде 76,4% қарсы 62,6%), операциядан кейінгі асқынулардың төмен жиілігі (0,2% қарсы 0,3%) және операциядан кейінгі өлім-жітімнің төмен деңгейі (0,7% қарсы 1,1%). Хирургиялық бөлімдегі шұғыл операциялардың жиілігі шамамен бірдей болды және 2021 жылы 19,1% құрады, бүкіл хирургия құрылымындағы амбулаториялық хирургияның жалпы үлесі (барлық профильдер бойынша) 11,3%.

Қорытынды. Хирургиялық бөлімшеде төсек қорын пайдалану көрсеткіштерінің анықталған нашарлауы (төсек айналымының төмендеуі, ауруханаға жатқызудың бір жағдайының орташа ұзақтығының өсуі, төсек-күн жоспарының төмендеуі) ауруханаға жатқызуды жоспарлау және бақылау жүйесін жетілдіруді талап етеді. Мүмкін, бұл мәселе көптеген көп салалы ауруханаларға қатысты болуы мүмкін.

Сравнительный анализ показателей деятельности хирургического отделения многопрофильного стационара в динамике за 5 лет (2017-2021 гг.)

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Аннотация

Во многих странах последние два десятилетия активно реализуются реформы, направленные на повышение производительности системы здравоохранения, рост эффективности лечебно-профилактической деятельности. И основными индикаторами рационального управления в стационаре остаются классические показатели деятельности стационара, использования коечного фонда и качества стационарной помощи.

Материал и методы. Объектом исследования являются медико-статистические показатели деятельности хирургического отделения и хирургического дневного стационара многопрофильного стационара г. Алматы за 5 лет (2017-2021 гг.). В качестве источников информации использовалась электронная база данных статистического отдела стационара. Использованы методы медицинского статистического анализа. Тип исследования: поперечное исследование, основанное на ретроспективном описательном анализе официальных статистических данных.

Результаты. Структура пролеченных в хирургическом отделении в динамике, в целом, не меняется. Но наблюдается резкое снижение частоты плановой хирургической патологии на фоне небольшого снижения уровня госпитализации в стационар (убыль -40%0), возможно, из-за уменьшения объема госзаказа (убыль -43,4%0). В рамках госзаказа показатель средней длительности пребывания больного в стационаре, в целом, имеет тенденцию к снижению с 8,5 в 2017 г. до 8,2 в 2021 г. Отмечены хорошие показатели хирургической работы: более высокий уровень хирургической активности в хирургическом отделении (в 2021 г. 76,4% против 62,6% в отделениях хирургического профиля), более низкая частота послеоперационных осложнений (0,2% против 0,3%) и более низкий уровень послеоперационной летальности (0,7% против 1,1%). Частота экстренных операций в хирургическом отделении была примерно одинаковой и составила в 2021 г. 19,1%, общая доля амбулаторной хирургии (по всем профилям) в структуре всей хирургии - 11,3%.

Заключение. Выявленное ухудшение показателей использования коечного фонда в хирургическом отделении (снижение оборота койки, рост средней длительности одного

Конфликт интересов: Авторы заявляют об отсутствии конфликта интересов

Ключевые слова: показатели, хирургическое отделение, многопрофильный стационар, амбулаторная хирургия.

случая госпитализации, снижение плана койко-дней) требует совершенствования системы планирования и контроля госпитализации в больницу. Возможно, эта проблема актуальна для многих многопрофильных стационаров.

Introduction

Many countries have actively implemented reforms over the last two decades to increase the productivity of the healthcare system and the effectiveness of treatment and prevention activities. These economic reforms are associated with the implementation of mandatory health insurance systems and unified national health accounts [11], as well as the strengthening of the role of quality in medical care provision and the widespread implementation of a paid medicine system in state medical organizations.

The main intra-system sources of financial savings in the healthcare system are rational management of medical care, stimulation of responsibility for the patient, coordination of the work of all services and links in the system, and organization of centralized competitive purchases and supplies of medicines to the MO [8]. The main in-hospital sources of savings remain the reduction in the cost of a case of hospitalization (including through the use of modern, effective organizational and clinical technologies) and the reduction of in-hospital costs without compromising the quality of medical care (including using hospital-replacing technologies). The economic evaluation of the effectiveness of treatment [2,6] is carried out in terms of money and medical and statistical indicators, such as the duration of hospitalization, the frequency of postoperative complications, the duration of postoperative hospitalization, the duration of temporary disability, etc. These indicators are important criteria for the effectiveness of treatment [12, 1].

The main indicators of rational management in a hospital are the classic indicators of hospital

activity (provision of the population with inpatient care; workload of medical personnel; material and technical and medical equipment); the use of hospital beds (structure of the hospital bed; bed occupancy per year; average length of stay of a patient in a bed; turnover beds); and the quality of inpatient care (hospital mortality, postoperative mortality, the frequency of postoperative complications, daily mortality, the percentage of matching diagnoses of the direction, clinical and pathoanatomical) [3, 7].

The purpose of the study is to characterize the activities of the surgical department of a multidisciplinary hospital in dynamics over 5 years (2017-2021) in order to identify reserves for improving the organization of surgical care in the hospital.

Material and methods

The object of the study is the medical and statistical performance indicators of the surgical department and the surgical day hospital of the multidisciplinary hospital in Almaty for 5 years (2017–2021). As a source of information, an electronic database of the statistical department of the hospital was used. Medical statistical analysis was applied as a method of study. This type of study is a cross-sectional study based on a retrospective descriptive analysis of official statistics.

Results

In terms of dynamics, the number of treated patients in the Almaty Multidisciplinary Hospital for 2017–2021 (Figure 1) was In general, the hospital decreased from 11127 to 10754 with a negative increase of 3,4%, while in 2019 the maximum number of hospitalizations was noted (11791 people, an increase of 8,1% compared to 2018).

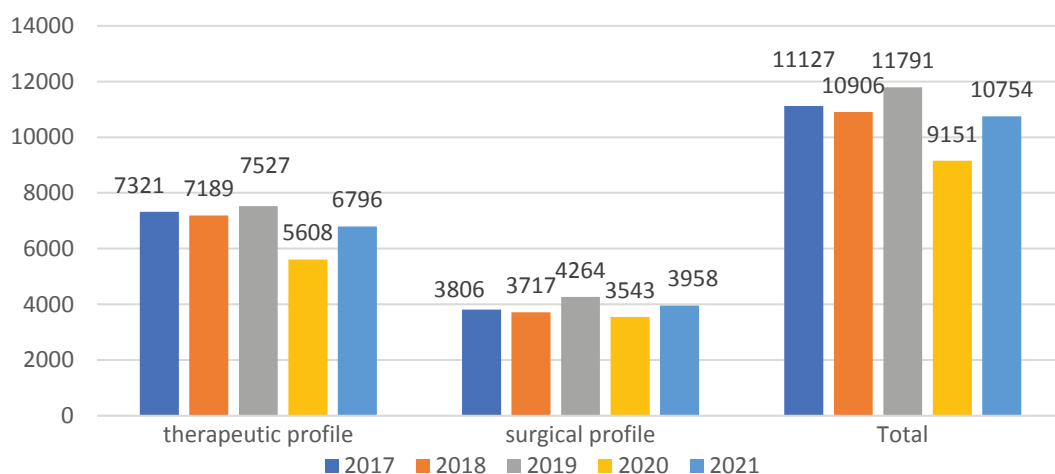


Figure 1. Dynamics of the total number of treated patients in for 2017-2021

In terms of dynamics, the number of treated patients in the hospital for 2017–2021 (Figure 1). In general, hospitalizations decreased from 11127 to 10754 with a negative increase of 3,4%, while in 2019 the maximum number of hospitalizations was noted (11791 people, an increase of 8,1% compared to 2018), largely due to the overall increase in coronavirus infection and, in particular, complications after COVID-19. A similar increase is typical for departments of the therapeutic profile in general (+4,7% to +14,7%) and the surgical profile in general (+4,7% to +14,7%). For a separate surgical department, a significant negative increase (-40%) was noted, which indicates a sharp decrease in the frequency of planned surgical pathology, including abdominal diseases, possibly due to a decrease in the volume of government orders.

In 2020, there was a significant decrease in the volume of total hospital admissions (from 11,791 to 9,151 people, an increase of - 22,4%), which was largely due to quarantine measures due to the coronavirus epidemic. A similar trend is typical for the departments of the therapeutic profile (negative growth of 25,5%) and the surgical profile (negative growth of 16,9%), as well as separately for the surgical department (20,0%).

The surgical department is characterized by a gradual decrease in the volume of hospitalizations from 855 in 2017 to 513

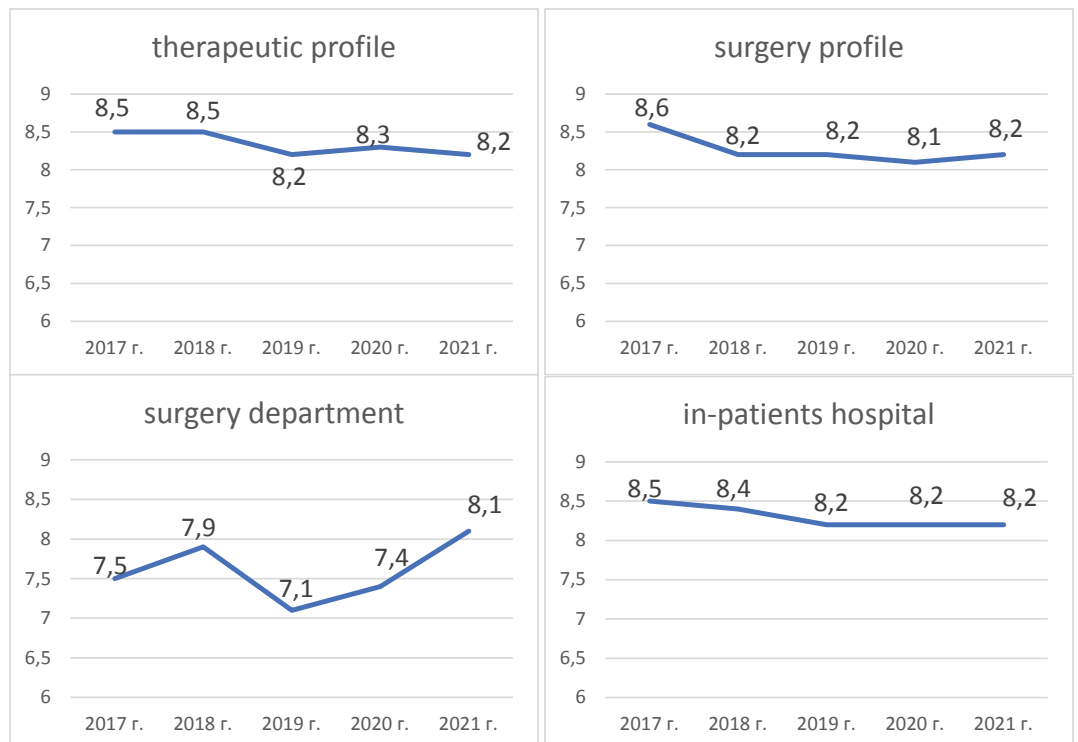
(negative growth of -40,0%).

Similar trends were noted for the dynamics of the indicator of the total number of bed days in the hospital as a whole, as well as separately for the departments of therapeutic and surgical profiles. The surgical department is characterized by a gradual decrease in the number of bed days from 5549 in 2017 to 3445 (negative growth of - 37,9%).

In dynamics, the indicator of the average length of stay of a patient in a hospital almost does not change and is equal to 7,9 bed-days. This indicator is higher in the departments of the therapeutic profile (8,1–8,3 bed-days) and lower in the departments of the surgical profile (7,3–8,2), and since 2018 it has been trending towards a gradual increase. And in the surgical department, this indicator is also gradually increasing from 2019 onward, from 6,2 to 6,7 in 2021. However, it should be noted that this is an aggregate indicator for hospitalization of patients on a state order and on a paid basis.

The indicator of the average length of stay of a patient in a hospital under the state order, in general, tends to decrease from 8.5 in 2017 to 8,2 in 2021 (Figure 2). The same dynamics are typical for therapeutic departments in general (with 8,5 to 8,1 bed days) and for surgical departments (from 8,6 to 8,2 bed days). But in a separate surgical department, this indicator is unstable, and in 2021 it rose to 8,1.

Figure 2. Dynamics of the average duration of hospitalization under the state order in the hospital for 2017-2021



The bed turnover rate in the surgical department tends to decrease from 46.5 in 2017 to 32,7 in 2021 (Figure 3), which may be due to the impact of the pandemic, which influenced the

decrease in hospitalization rates. The increase in the average duration of one hospitalization in the department from 6,4 days in 2017 to 7,3 days in 2021 is also an unfavorable factor in

hospital management. It should be noted the unsatisfactory situation with the implementation of the plan of bed days: there is a decrease in the indicator from 100,6% in 2017 to 72,2% in 2021, which indicates that the department

is unprofitable; however, this gap is filled by the provision of paid medical services in this department. The situation is similar with the bed occupancy rate per year: its extremely low values also indicate incorrect planning.

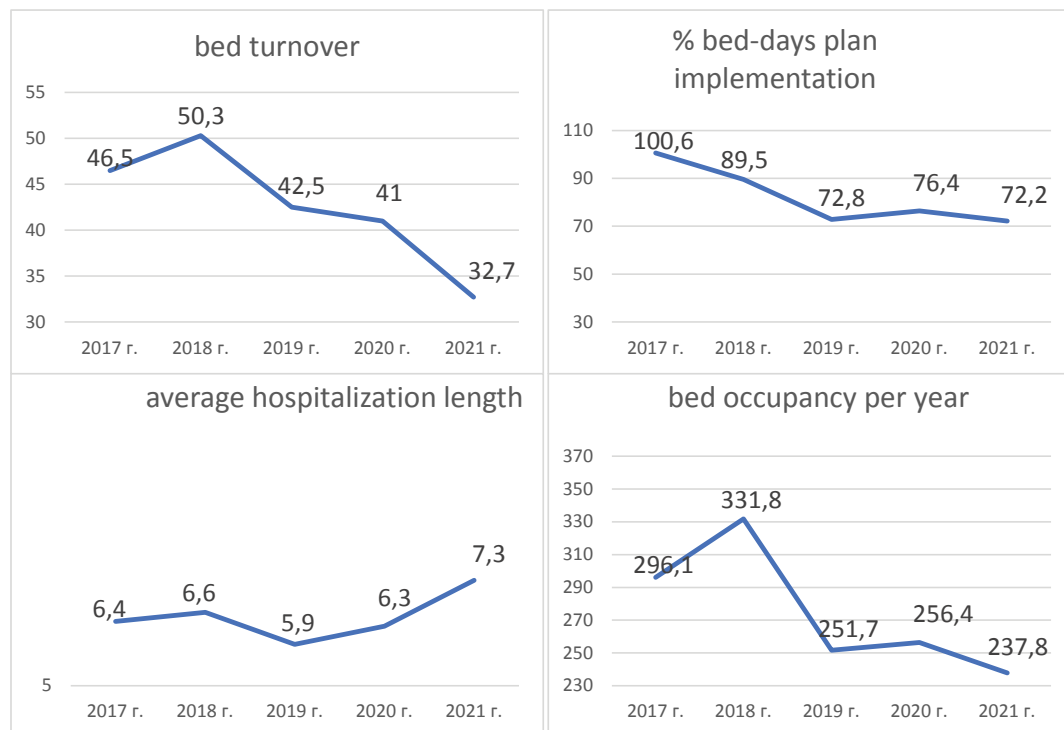


Figure 3. Dynamics of bed performance indicators in the surgical department of the multidisciplinary hospital for 2017-2021

In 2021, the ratio of paid to state-ordered hospitalizations in the multidisciplinary hospital was 34,4% to 65,6% (Figure 4). The rate of paid hospitalization is comparatively higher in therapeutic departments compared to surgical departments (38% versus 27,7%). It should be noted that in a separate surgical department, the frequency of paid hospitalization is very high (41,3%).

In 2021, the ratio of paid to state-ordered hospitalizations in the multidisciplinary hospital was 34,4% to 65,6% (Figure 4). The rate of paid hospitalization is comparatively higher in therapeutic departments compared to surgical departments (38% versus 27,7%).

It should be noted that in a separate surgical department, the frequency of paid hospitalization is very high (41,3%).

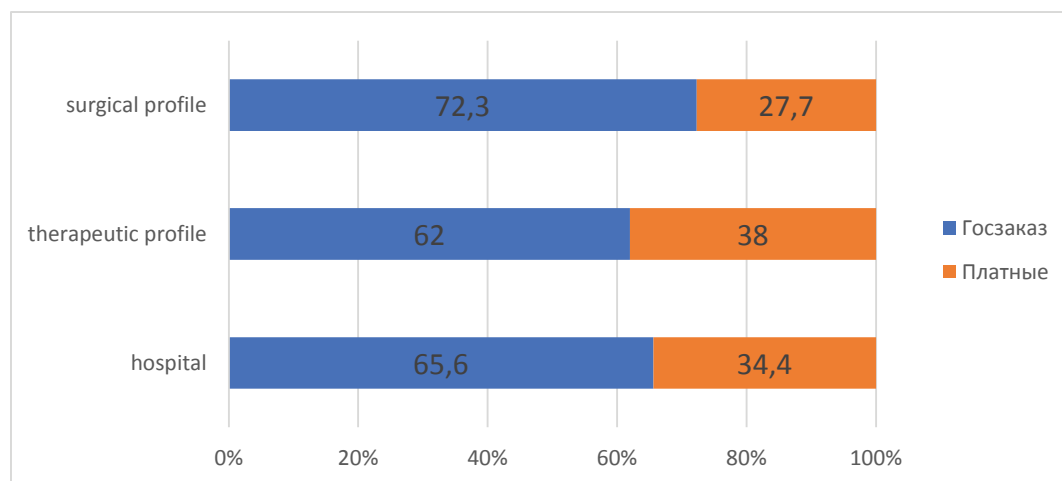


Figure 4. The ratio of paid to unpaid hospitalization under the state order (by the number of hospitalized patients) in the multidisciplinary hospital in 2021 (%)

At the same time, the total volume of hospitalizations under the state order in the MSA hospital increased from 6,401 in 2017 to 6,868 in 2021 (an increase

of 7.3%). Similar trends were noted for departments of the therapeutic and surgical profiles (an increase of +6,5% and +8,6%). But in the surgical department, the volume of hospitalizations under the state order decreased from 438 in 2017 to 248 in 2021 (a negative increase of 43,4%). At the same time, the total volume of hospitalizations under the state order in the disciplinary hospital increased from 6,401 in 2017 to 6,868 in 2021 (an increase of 7,3%). Similar trends were noted for the therapeutic and surgical profiles (an increase of 6,5% and 8,6%, respectively). But in the surgical department, the volume of hospitalizations under the state order decreased from 438 in 2017 to 248 in 2021 (a negative increase of 43,4%).

The total volume of paid hospitalizations in the MSA hospital decreased from 4,726 in 2017 to 3,886 in 2021 (an increase of 17.8%), but at the same time, a positive trend has been noted over the past year. Similar trends were noted for the departments of therapeutic and surgical profiles (increases of -23,7% and -3,8%, respectively), as well as for the surgical department, which went from 417 in 2017 to 265 in 2021 (a negative increase of -36,5%).

The sharp decrease in the total number of paid hospitalizations in 2020 is apparently associated with the COVID-19 pandemic and the quarantine regime, while the increase in 2021 is due to the return of the population to a normal mode of life.

Thus, against the background of a slight decrease in the level of hospitalization in the multidisciplinary hospital in the surgical department, this volume decreased significantly (from 855 to 513 people; a negative increase of -40% 0), which indicates a sharp decrease in the frequency of elective surgical pathology, incl. about abdominal diseases, possibly due to a decrease in the volume of government orders (from 438 in 2017 to 248 in 2021; a negative increase of -43,4%0). The sharp decrease in the total number of paid hospitalizations in 2020 is apparently associated with the COVID-19 pandemic and the quarantine regime, while the increase in 2021 is due to the return of the population to a normal mode of life.

Thus, against the background

of a slight decrease in the level of hospitalization in the multidisciplinary hospitals surgical department, this volume decreased significantly (from 855 to 513 people; a negative increase of -40% 0), which indicates a sharp decrease in the frequency of elective surgical pathology, including abdominal diseases, possibly due to a decrease in the volume of government orders (from 438 in 2017 to 248 in 2021; a negative increase of -43,4% 0).

Accordingly, this process was accompanied by a gradual decrease in the number of bed-days from 5549 to 3445 (negative growth of -37,9%). As part of the state order, the indicator of the average length of stay of a patient in a hospital, in general, tends to decrease from 8,5 in 2017 to 8,2 in 2021, but in the surgical department, this indicator is unstable, and in 2021 it rose to 8,1. In the structure of hospitalizations in the surgical department, the frequency of paid hospitalizations is very high (41,3%), but the volume of paid hospitalizations decreased from 417 in 2017 to 265 in 2021 (a negative increase of -36,5%), possibly due to the COVID-19 pandemic and the quarantine regime. A negative situation was noted with the deterioration of the bed capacity in the surgical department: a decrease in bed turnover (from 46,5 in 2017 to 32,7 in 2021), an increase in the average duration of 1 case of hospitalization (from 6,4 to 7,3), and a decrease in the number of bed days (from 100,6% to 72,2%), which indicates that the department is unprofitable.

A comparison of the indicators of surgical work in the surgical department and in general according to the ISA for 2017-2021 (Figure 5) revealed positive results: a higher level of surgical activity in the surgical department (in 2021, 76,4% vs. 62,6% in surgical departments), a lower rate of postoperative complications (0,2% vs. 0,3% in surgical departments), and a lower rate of postoperative complications (0,2% vs. 0,3% in surgical departments). However, the average length of a patient's stay in bed before surgery is slightly longer (1,5 days versus 1,2).

In 2021, the frequency of emergency operations in the surgical department was roughly the same, at 19,1%.

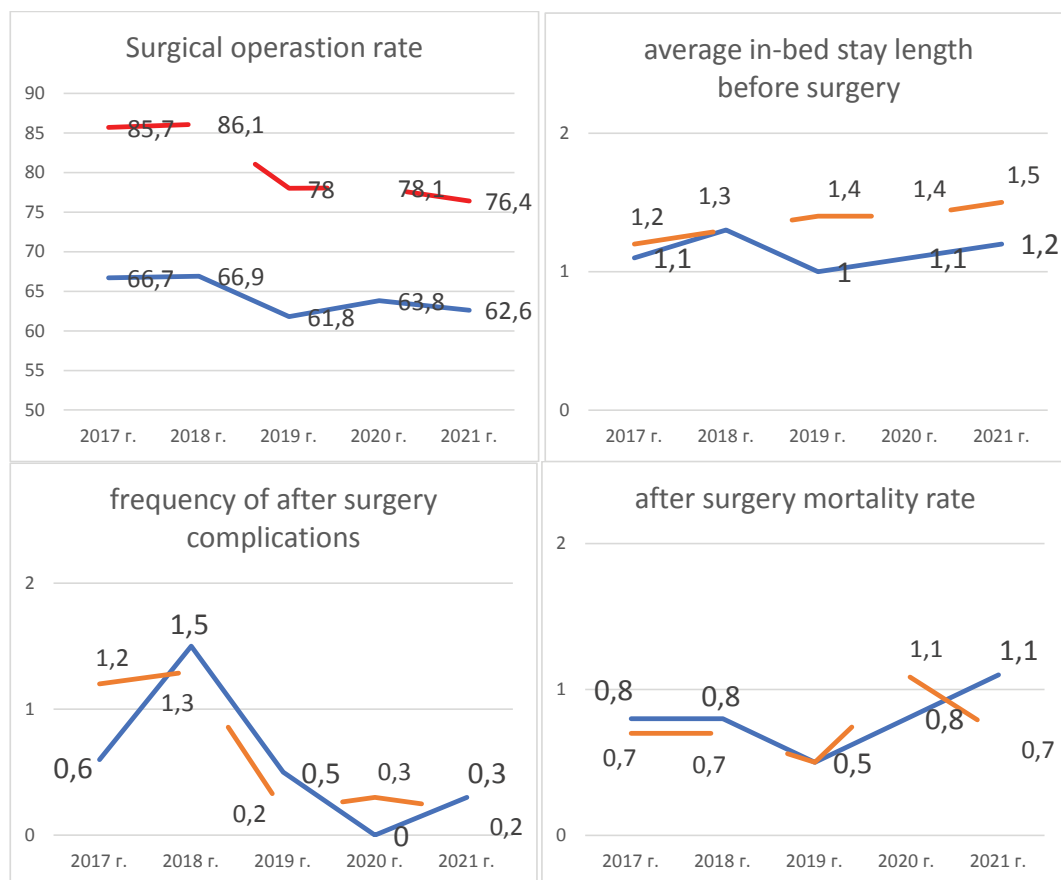


Figure 5. Dynamics of surgical work indicators in the surgical department (dotted line) and in the hospital in general (solid line) for 2017-2021

In the dynamics of 2017-2021 The structure of treatment outcomes for patients in the multidisciplinary surgical department changed, with an increase in the recovery rate (from 55,1% to 60,3%) and a decrease in the mortality rate (from 0,7% to 0,2%).

Thus, in the structure of those treated in the surgical department, slightly more than half are people over the age of 50 (58,7%), and half were paid patients (49,9%). In the nosological structure of hospitalization in the surgical department of a hospital in 2021, diseases of the digestive system are leading (81,2%), neoplasms are in second place (9,8%), and diseases of the skin and subcutaneous tissue are in third place (5,5%). Of the pathologies of the gastrointestinal tract, cholecystitis/cholangitis (32,5%) and cholelithiasis (30,9%) are the most common, followed by hernias (15,2%) and acute pancreatitis (12,1%).

There was a higher level of surgical activity in the surgical department (in 2021, 76,4% vs. 62,6% in surgical departments), a lower incidence of postoperative complications (0,2% vs. 0,3%), and a lower postoperative mortality rate (0,7% versus 1,1%). In 2021, the frequency of emergency operations in the surgical department remained roughly the same, at 19,1%. In terms of dynamics, the structure of treatment outcomes for patients in the surgical department improved,

with an increase in the recovery rate (from 55,1% to 60,3%) and a decrease in the mortality rate (from 0,7% to 0,2%).

Discussion

Thus, in the structure of those treated in the surgical department, slightly more than half are people over the age of 50 (58,7%), and half are paid patients (49,9%). In the nosological structure of hospitalization in the surgical department of a hospital in 2021, diseases of the digestive system are leading (81,2%), neoplasms are in second place (9,8%), and diseases of the skin and subcutaneous tissue are in third place (5,5%). Of the pathologies of the gastrointestinal tract, cholecystitis/cholangitis (32,5%) and cholelithiasis (30,9%) are the most common, followed by hernias (15,2%) and acute pancreatitis (12,1%). This structural characteristic of patients is similar to the results of Russian researchers [5, 9].

For 2017-2021 against the background of a slight decrease in the level of hospitalization in the multidisciplinary hospitals surgical department, this volume decreased significantly, almost 2 times (a decrease of -40% 0), which indicates a sharp decrease in the frequency of planned surgical pathology, possibly due to a decrease in the volume of state orders (a decrease of -43,4% 0). Accordingly, this process was accompanied by a gradual decrease in the number of bed-days

(a decrease of -37,9%). As part of the state order, the indicator of the average length of stay of a patient in a hospital, in general, tends to decrease from 8,5 in 2017 to 8,2 in 2021, but in the surgical department, this indicator is unstable, and in 2021 it rose to 8,1. In the structure of hospitalizations in the surgical department, the frequency of paid hospitalizations is very high (41,3%), but the volume of paid hospitalizations has decreased (decrease -36,5%), possibly due to the COVID-19 pandemic and the quarantine regime. A negative situation was noted with the deterioration of the bed capacity in the surgical department: a decrease in bed turnover (from 46,5 in 2017 to 32,7 in 2021), an increase in the average duration of 1 case of hospitalization (from 6,4 to 7,3), and a decrease in the number of bed days (from 100,6% to 72,2%), which indicates that the department is unprofitable.

A higher level of surgical activity in the surgical department (in 2021, 76.4% vs. 62.6% in surgical departments), a lower incidence of postoperative complications (0.2% vs. 0.3%), and a lower postoperative mortality rate (0.7% versus 1.1%) have been indicated as positive trends in surgical service. The frequency of emergency operations in the surgical department was approximately the same and amounted to 19,1% in 2021. In dynamics, the structure of treatment outcomes for patients in the surgical department improved with an increase in the recovery rate (from 55,1% to 60,3%) and a decrease in the mortality rate (from 0,7% to 0,2%). When comparing our results with the data of Russian researchers, it was found that the surgical activity was higher (62,6–76,4% vs. 60,6%), but the turnover of the surgical bed was lower (46,5–32,7 vs. -60,3%) and above the average length of stay (6,4–7,3 versus 5,5–6,0) [4, 10], which indicates the need to rationalize the system of in-hospital planning and control of the hospitalization process.

It should also be noted that, in order to assess the level of innovative technologies used in surgery, we did not find data on accounting for the volumes of laparoscopy and endoscopy in the system of Kazakhstan statistics.

Conclusion

The structure of those treated in the surgical department in terms of dynamics, in general, does not change. But there is a sharp decrease in the frequency of planned surgical pathology against the background of a slight decrease in the level of hospitalization in a hospital (a decrease of -40% 0), possibly due to a decrease in the volume of government orders (a decrease of -43,4% 0). Within the framework of the state order, the indicator of the average length of stay of a patient in a hospital, in general, tends to decrease from 8,5 in 2017 to 8,2 in 2021. Good indicators of surgical work were noted: a higher level of surgical activity in the surgical department (in 2021, 76,4% vs. 62.6% in surgical departments), a lower postoperative complication rate (0,2% vs. 0,3%), and a lower postoperative mortality (0,7% vs. 1,1%).

The identified deterioration in the use of beds in the surgical department (decrease in bed turnover, increase in the average duration of 1 case of hospitalization, decrease in the planned number of bed days) requires improvement of the system for planning and monitoring hospitalization in the hospitals. Perhaps this problem is relevant for many multidisciplinary hospitals.

The frequency of emergency operations in the surgical department was approximately the same and amounted to 19,1% in 2021; the total share of outpatient surgery (in all profiles) in the structure of all surgery was 11,3%. And if the frequency of emergency surgery cannot be controlled, then the volume of outpatient surgery can be increased.

For a systematic assessment of the level of innovative technologies used in surgery, it is necessary to include in the system of Kazakhstan statistics accounting for the volume of laparoscopy and endoscopy, as well as accounting for the characteristics of outpatient surgery (nosological structure, gender, and age characteristics of patients), because the analysis of such information on a national scale will provide an opportunity to rationally plan the volume of outpatient surgery, including under government orders.

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