FUCS

Repertorio de Medicina y Cirugía

Vol. 33
N°1 . 2024

ISSN: 0121-7372 • ISSN electrónico: 2462-991X

Review article

Factors influencing the cancellation of scheduled surgeries: a literature review

Factores que influyen en la cancelación de cirugías programadas: una revisión de la literatura

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ABSTRACT

Introduction: Scheduled surgery cancellation is a major problem in healthcare provision, negatively affecting patients and their families, the healthcare staff, and the healthcare institution itself. It carries an increase in hospital costs, lost time, and creates physical issues for healthcare staff. *Methodology:* A narrative review of the literature was carried out based on concepts that specified the meaning of the search in the PubMed, Scielo, and Google academic databases. The inclusion criteria were all articles, on the topic, published between 2014 and 2021, in Spanish and English, including an abstract, and that could be accessed for free. *Results:* the main causes for surgery cancellation were identified and grouped as patient-related factors, administrative aspects, logistics failures, such as lack of medical/surgical devices, and surgeon-related or anesthesiologist-related causes. *Conclusion:* this topic will always be valid and a subject of continuous analysis, due to the

ARTICLE INFORMATION

Article Story:
Date received: september 28, 2022
Date accepted: june 21, 2023

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DOI
10.31260/RepertMedCir.01217372.1392

repercussions on patients, the institution, costs, and the operating room staff. To review the causes for surgery cancellation, is important, so they may be addressed when detected, and may contribute to improve the quality of healthcare.

Keywords: microbiota, interacciones microbiota-hesped, síndrome metabólico, dieta, disbiosis.

RESUMEN

Introducción: la cancelación de una cirugía es un tema relevante en la asistencia en salud, debido a las consecuencias en los pacientes y su familia, el personal de salud y la institución. Está implícita el alza en los costos hospitalarios, el tiempo perdido y las repercusiones físicas para el personal de salud. *Metodología:* revisión narrativa de la literatura sobre conceptos que precisan el sentido de la búsqueda con herramientas en las bases de datos PubMed, Scielo y Google académico. Los criterios de inclusión de los artículos fueron aquellos publicados desde 2014 hasta 2021 en español e inglés, que tuvieran resumen y fueran accesibles sin algún tipo de pago. *Resultados:* las causas más frecuentes para cancelar las cirugías están enmarcadas en factores propios del paciente, en la parte administrativa, en fallas de la logística como la ausencia de dispositivos médico-quirúrgicos, y a la cancelación por el especialista y el anestesiólogo. *Conclusión:* esta temática siempre estará vigente y en continuo análisis debido a las repercusiones en los pacientes, la institución, los costos y el personal del quirófano. Es importante revisar las causas de la cancelación de cirugías, que al ser detectadas puedan solucionarse y contribuyan a la mejora de la calidad de atención en la salud.

Palabras clave: cirugía, sala de cirugía, calidad, programación.

INTRODUCTION

Scheduled surgery cancellation implies the fact of not performing a surgical procedure on the day and time it was scheduled; or last-minute cancellations, even when the patient is already in the operating room, resulting in emotional distress for patients, related to postponing their treatment, and is a parameter to assess the quality of patient care from surgery planning to patient preparation. Therefore, it is an adverse event, which unintentionally generates hardships for the patient.[1]

Surgery cancellation, "is defined as any scheduled surgical intervention, which due to various reasons, cannot be performed on the day and time in which it was scheduled, nor be rescheduled ".[2]

Given the growing incidence of trauma, cancer and cardiovascular diseases, the burden of surgery on health care systems will increase. It is estimated that 234 million major surgeries are performed worldwide every year, which is equivalent to one operation in every 25 people of the overall world population. Despite the cost effectiveness that surgery can have in terms of lives saved and disabilities prevented, lack of access to quality surgical care remains a serious problem worldwide.[1]

The scheduled surgery cancellation rate reported in Latin America varies between countries, for example, in Mexico it ranges from 4.5% to 18% and in Colombia it represents around 13.2%.[3] Cancellation rates in the rest of Latin America have a similar behavior, 7.6% in Argentina, and 27.4% in Brazil (3.18). In other countries of the world, elective surgery cancellation rates are 1.96-16.5% in the United States; 21% in Pakistan; 30.3% in India; 4% in the United Kingdom; 6.5% in Spain; 7.6% in Hong Kong; 4.5% in Finland; and 0.37% in Taiwan.[4]

In Colombia the rate of cancellation ranges between 2.7 and 7.6%[4] but has decreased from 6.95% in 2009 to 6.13% in the last decade. Likewise, 70% of the authorized Healthcare Providing Institutions (IPSs), reported a decreasing trend of this indicator. Some studies have evidenced that a high proportion of scheduled surgeries are canceled due to potentially preventable reasons, most of the time.[5]

It is worth noting that surgery cancellation is a significant event, which requires the attention of the healthcare team, since institutions should be aware of the consequences that may affect the patient, the family, the institution, and the state itself, which generate additional costs, lost time, and an increase in hospital admissions.[6]

METHODOLOGY

A narrative review of the literature was carried out based on concepts that specify the meaning of the search in the PubMed, Scielo, and Google academic databases. The key DeCS descriptors used were operating room, quality, and programming.

The inclusion criteria were all original articles, review articles, graduation research projects, and reports on the topic, published between 2014 to 2021, in Spanish and English.

DISCUSSION

The cancellation of surgeries is a crucial patient care quality indicator. The goal is to minimize the frequency of these events, especially when the reasons are not patient-related but are due to failures in the sterilization center processes, lack of surgical supplies, or institutional disciplinary and administrative ineffectiveness.[7]

The most frequent reasons identified among studies were similar, the most common being non- favorable clinical conditions of patients to undergo surgery, institutional-related issues regarding its structure and organization, and patient absence.[8]

The causes of surgery cancellation can be grouped into three large categories:

A) Hospital-related causes, such as: overrun of previous surgeries because of prolongation of procedures because of unpredictable events, prolonged changeover and cleaning time between surgeries due to infrastructure failures, unavailability of a recovery bed, among others, lack of surgical material: prostheses, electrosurgical cautery, sutures, prosthetic mesh, etc., shortage of hospital beds, nursing staff absences, surgical instrument technician failure to ensure the correct surgical instruments are available, lack of a blood bank in the institution, cancellation of the elective surgery shift due to priority emergency surgeries, lack of a bed in the Intensive Care Unit (UCI), and administrative issues.

B) Patient-related causes: improvement in patient medical status, acute intercurrent illness, patient rejects the surgeon, cancellation by the patient, patient unpreparedness for surgery for not following instructions correctly (patient comes without fasting or did not stop anticoagulation therapy, etc.), patient acute illness in days prior to surgery, or patient no-shows on the day of surgery.

C) Medical staff-related causes: absence of the specialist, cancellation by the surgeon or the anesthesiologist, not requesting a preoperative evaluation or laboratory workup, nonavailability of laboratory reports, and not conducting preoperative blood ordering, when required.[2]

In a hospital in Argentina, the overall surgery cancellation rate was 7.6%. Logistics and administrative issues represented 44.2%, while medical reasons (non-surgical) reasons represented 40.8%. Anesthesia-related causes accounted for 5.4% of overall surgery cancellations.[9]

In Chile, a study conducted in 2018, found that in at least 57% of cases, the main cause of cancellation identified was a change in patient medical status.[10]

A study conducted by the National University of Nicaragua in 2016, revealed that the most frequent causes of surgery cancellation were:

1. Attributable to the patient: for failing to attend the booked surgery appointment or presenting a hypertensive crisis. 2. Attributable to the hospital: due to poor air conditioning or lack of osteosynthesis materials. 3. Attributable to human resources,

and finally, to the lack of a surgical instrument technician or lack of a surgeon.[11]

A study conducted in Cuba, found that most surgeries were suspended for patient-related causes (89.8%), such as patient nonattendance on the day of the intervention being the most frequent (78.7%), or patient presenting high blood pressure (3.8%). Other identified causes were a delay of the previous surgical shift (3.6%) and administrative issues (3.0%).[12]

In Peru, a study detected the main factor for gynecological surgeries cancellation were medical issues in 46.5%; administrative issues in 36.6%, mainly due to lack of operating room time in 25.4%.[13] Likewise, another study conducted in Peru in 2016 showed that the causes of suspension of surgeries according to patient institutional status, are patient-related causes.[14]

A study carried out in Cali, Colombia, found that 70.91% of surgery cancellations in a level III clinic were attributed to patient-related causes, 12.73% to administrative causes, 12.73% to causes related to the pandemic and 3.64% due to causes related to the specialist. The specialties with the highest rate of suspension were orthopedics and general surgery.[15]

Similarly, in Barranquilla, two studies were carried out on this topic. Where in 2016, of the total 3207 scheduled procedures, 7.6% were cancelled. The months with the lowest and highest incidence of cancellation were August with 3.7% and November with 14.8%, respectively. The causes of cancellation were classified as attributable to the institution (38.1%), the user (40.6%) and attributable to medical orders (21.3%).[16]

Diaz´s weekly study, found that the factor related to non-favorable medical conditions affecting the patient, appeared in up to 45.9% of cases.[17]

A study conducted in the city of Bucaramanga in 2019, reported that there were other causes of surgery cancellation that may be attributable to administrative factors such as: previous surgery prolongation in 16.5%, poor patient preparation in 4.1%, unavailability of ICU bed in 16.3%, unavailability of sterile clothing in 0.5%, unavailability of surgical instruments in 0.2%, and unavailability of medicines in 1.0%. [7]

The cancellation of scheduled surgeries is considered as one of the unsafe healthcare practices that can lead to adverse events, specifically including those factors related to resource management, such as lack of surgical supplies or equipment, lack of sterile clothing or staff shortage, as priority emergency surgical procedures, superseding the elective schedule, may also be povided (as shown in **figure 1**).[16]

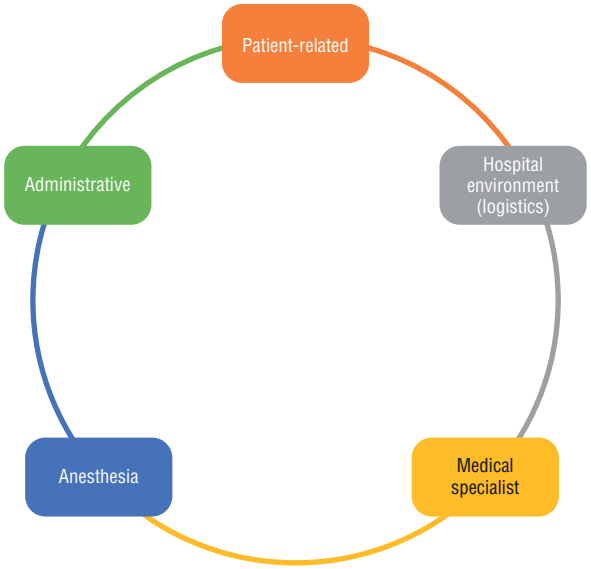

Figure 1. Causes of cancellation of surgeries
Source: the authors.

Cancellation of surgeries amid the pandemic

The cancellation of elective surgeries is a frequent phenomenon occurring in health institutions.[18] At the national and international level, just three months after the quarantine began in the world, due to the COVID-19 pandemic, more than 28.500.000 surgical interventions were canceled in more than 190 countries around the world. According to the WHO report, 30% of the affected population were cancer patients.[19] The scientific research group estimated that 72.3% of elective surgeries worldwide, would be canceled during the COVID-19 pandemic.[20]

As experienced at a Hospital in Madrid, Spain, the spread of the SARS-CoV-2 (COVID-19) infection has required the adaptation of hospitals affected by the pandemic, causing an elective surgical activity reduction.[21] Most of the surgical team personnel (93%) agreed with the cancellation of elective procedures, and were willing to be relocated in other services, if necessary.[22]

It has been shown, that with the optimal use of COVID-19 infection prevention procedures, it is safe to intervene in non-Covid-19 patients, since the surgical procedure do not increase the risk of complications or the risk of contagion for patients or health care professionals.[23]

Consequences of surgery cancellation

Surgery cancellations occur most of the time on the day of the scheduled procedure, generating an up to 90-minute delay in operating room changeover, increasing cost overruns which are preventable by reviewing the preoperative assessment processes.[24]

The cancellation of scheduled surgical procedures carries social, economic and health impacts on the affected patients, as well as on the whole population, by generating a decrease of health care effectiveness and efficiency.[25]

The cancellation of a scheduled surgery is a crucial quality measurement which can be related to inefficiency in the patient safety processes.[26]

Strategies to reduce surgery cancellation rates

Various authors have provided recommendations to reduce surgery cancellation rates, due to preventable causes, such as, strengthening mandatory and adequate application of the Double Pre-surgical Checklist. A study conducted in Argentina, suggests healthcare professionals to provide integrated verbal and written presurgical instructions, which will perhaps contribute to timely scheduled operations thus preventing their cancellation.[27]

To promote patient surgical safety, the World Health Organization developed the Surgical Safety Checklist. Compliance with protocols such as a checklist guarantees patient safety and accredits healthcare professionals´ good practice.[28]

It seeks to eliminate the factors that lead to the cancellation of scheduled surgeries, through healthcare teams and administrative staff self-assessment, on specific aspects related to the prior planning of surgical procedures regarding human resources, materials, and supplies management.[29]

The strategy for elective surgical procedures reactivation, contemplates the expansion and adaptation of hospital infrastructure, prioritizing intensive care units (ICU) and reducing hospital admissions for surgical procedures (as shown in **figure 2**).[30]

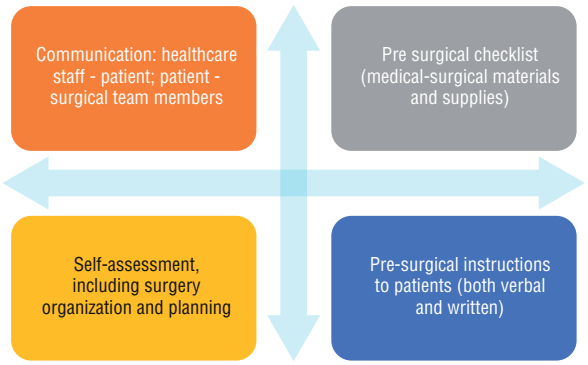

Figure 2. Strategies to prevent the cancellation of surgeries.
Source: the authors.

CONCLUSION

The major causes for surgery cancellation were identified and classified as patient-related factors, administrative aspects, logistics failures, such as lack of surgical/ medical

supplies and devices, and cancellations dependent on the specialist and anesthesiologist. Most of these causes can be prevented by using tools such as providing clear preoperative instructions to patients, and the application of checklists through which the surgical staff reviews the availability of the required supplies and equipment.

CONFLICT OF INTERESTS

The authors declare no conflicts of interest and respect the authorship of all consulted research publications.

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