







Cancellation of outpatient surgery: an integrative review

Cancelamento cirúrgico ambulatorial: uma revisão integrativa

Cancelación quirúrgica ambulatoria: una revisión integradora

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ABSTRACT

Objective: to discuss the scientific evidence on the causes of cancellation in outpatient surgery. **Method:** this integrative review involved searching the Medline, Embase, Lilacs, Cinahl, Web of Science and Scopus electronic databases using the controlled terms Ambulatory Surgical Procedures, Ambulatory Surgery, Suspension and free synonyms. **Results:** 13 studies were selected. By country, the United States, with 0.5%, had the lowest outpatient surgery cancellation rate, and Nigeria, with 25.40%, the highest. The fifty-three causes of outpatient surgery cancellation found were grouped into three categories: patient, clinical, and institutional factors. **Conclusion:** the causes of outpatient surgical cancellation were found to be diverse and common in institutions, the most frequent cause being patient absence on the day of the scheduled procedure, demonstrating that care and management strategies need to be developed and applied.

Descriptors: Perioperative Nursing; Ambulatory Surgical Procedures; Withholding Treatment.

RESUMO

Objetivo: discutir as evidências científicas sobre as causas de cancelamento em cirurgia ambulatorial. **Método:** trata-se de uma revisão integrativa com busca nas bases de dados eletrônicas Medline, Embase, Lilacs, Cinahl, Web of Science e Scopus, a partir dos termos controlados *Ambulatory Surgical Procedures*, *Ambulatory Surgery*, *Suspension* e termos livres sinônimos. **Resultados:** selecionaram-se 13 estudos. O país com menor taxa de cancelamento cirúrgico ambulatorial foi os Estados Unidos com 0,5%, e o maior, a Nigéria com 25,40%. Foram encontradas 53 causas de cancelamento em cirurgia ambulatorial, das quais agrupou-se em três categorias: fatores do paciente, clínicos e institucionais. **Conclusão:** Evidencia-se que as causas de cancelamento cirúrgico ambulatorial foram diversas e comuns nas instituições, sendo o absenteísmo do paciente no dia do procedimento agendado a causa mais frequente, demonstrando que estratégias assistenciais e de gestão precisam ser realizadas.

Descritores: Enfermagem Perioperatória; Procedimentos Cirúrgicos Ambulatórios; Suspensão de Tratamento.

RESUMEN

Objetivo: discutir la evidencia científica sobre las causas de cancelación en cirugía ambulatoria. **Método:** se trata de una revisión integradora con búsqueda en las bases electrónicas de datos Medline, Embase, Lilacs, Cinahl, Web of Science y Scopus, utilizando los términos controlados *Ambulatory Surgical Procedures*, *Ambulatory Surgery*, *Suspension* y términos sinónimos libres. **Resultados:** se seleccionaron 13 estudios. El país con la tasa de cancelación quirúrgica ambulatoria más baja fue Estados Unidos con un 0,5% y el de más alta Nigeria, con un 25,40%. Se encontraron 53 causas de cancelación en cirugía ambulatoria, las cuales se agruparon en tres categorías: factores del paciente, clínicos e institucionales. **Conclusión:** Se pone en evidencia que las causas de cancelación de cirugía ambulatoria fueron diversas y comunes en las instituciones, siendo la causa más frecuente el absentismo del paciente el día del procedimiento programado, demostrando que es necesario realizar estrategias de atención y de gestión.

Descritores: Enfermagem Perioperatória; Procedimientos Quirúrgicos Ambulatorios; Privación de Tratamiento.

INTRODUCTION

Surgery cancellation was defined as any scheduled surgery that was not performed on the foreseen day¹. It is a recurrent issue in different countries, imposing harms on the patients and on their family members, the professionals involved, the institution and the Unified Health System (*Sistema Único de Saúde*, SUS). Although there is no consensus in the literature regarding the surgery cancellation rate, low indices may reflect surgical services with better quality and efficiency levels².

The operating room represents one of the biggest revenue sources for a health institution: however, it can be considered one of the most expensive components in terms of surgical care, resulting in high costs in human and material resources. Consequently, proper use of operating rooms is fundamental, investigating the causes of the cancellations, thus avoiding the economic impact and financial burden for health units that perform outpatient surgeries^{3,4}.

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Outpatient surgeries are those in which the anesthetic-surgical procedure is performed and the patients are discharged from the unit on the same day⁵. Given this context and due to its nature, specificity and logistic restrictions, cancellations limit recruiting a new patient on the day scheduled for the surgery⁶.

Several advantages are presented with the performance of outpatient surgeries, as they require short-term postoperative care, generating lower hospital costs in health care; with lower rates of complications and postoperative infections, as well as fewer changes in the routine of the patients and their families. Due to the high demand of patients who need surgical procedures, outpatient surgery has represented a quick, adequate, economical and highly safe solution, as well as it has contributed to the reduction of surgery cancellations due to lack of hospital beds for the postoperative period⁷.

In 2019, the SUS performed 48 million surgical procedures in Brazil, with 89% of an outpatient nature. In 2020 and 2021, periods extremely affected by the COVID-19 pandemic, there was a considerable drop in the number of surgeries performed, with a direct impact on outpatient surgeries, falling from more than 40 million procedures in 2019 to slightly more than 17 million in 2021. In the same period, the number of in-hospital surgeries remained above 4 million, with a reduction of slightly more than 800,000 procedures between 2019 and 2021. Even so, the number of outpatient surgeries performed was higher than the in-hospital ones, with a four-to-one ratio, respectively⁸.

Given the above, it is justified to carry out this study, which is relevant not only for managers of institutions that provide surgical services on an outpatient basis, but, above all, to society and to the SUS.

Due to the scarcity of studies addressing the causes of outpatient cancellations, it is believed that collection of this diverse evidence will allow for further reflection on the topic and advance in the development of improvement actions in outpatient surgical care units. The objective of this study was to discuss the diverse scientific evidence about the reasons for outpatient surgery cancellations.

METHOD

An integrative literature review was carried out proposing to identify and discuss the available research studies on a particular study object, based on the best available and current evidence, having the potential to guide leaders in the decision-making process. The current integrative review was prepared in six different stages⁹. The *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) checklist was applied to guide organization of the diverse information¹⁰.

The first stage, which consisted in formulating the guiding question based on the PICo variation¹¹, where P=Population (patients undergoing surgery, over 18 years of age), I=Phenomenon of interest (cancellation), and Co=Context (outpatient surgery). The following research question was formulated: Which is the diverse scientific evidence of the reasons for surgery cancellations in the outpatient surgical context among patients aged over 18 years old?

The inclusion and exclusion criteria corresponding to the studies selected were established in the second stage. The articles included were those available in full, with no time clipping, written in any language, and with varied study designs. The exclusion criteria adopted corresponded to not using incomplete texts, reports, theses or dissertations, letters to the editor, review studies, institutional protocols or book chapters.

The searches were carried out in September 2021 via the CAPES Journals Portal, correlating the *Ambulatory Surgical Procedures*, *Ambulatory Surgery* and *Suspension* descriptors and free synonyms, in order to find diverse scientific evidence to answer the research question. To identify the search terms, terms from the Descriptors in Health Sciences (*Descritores em Ciências da Saúde*, DeCS), *Medical Subject Headings* (MeSH) and *Embase Subject Headings* (Emtree) controlled vocabularies were consulted according to each database, combined with synonyms through Boolean operators. Uncontrolled terms and synonyms were used, as there is no DeCS/MeSH/ENTREE descriptor for "surgery cancellation".

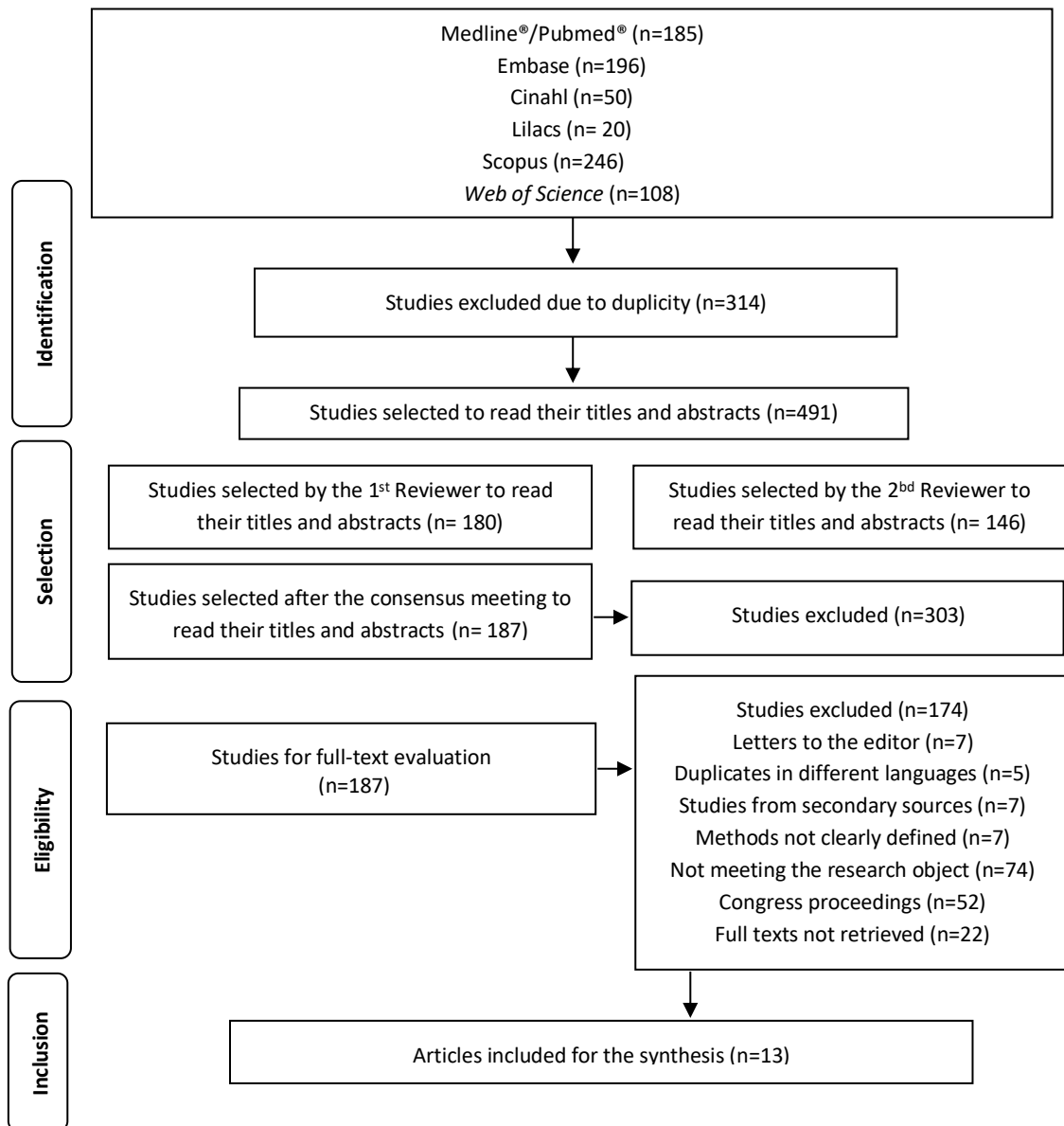
The survey of publications was carried out in the following electronic databases: Medical Literature Analysis and Retrieval System Online (Medline) via PubMed, Excerpta Medica Database (Embase), Latin American and Caribbean Health Sciences Literature (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*, LILACS), via the Virtual Library in Health (*Biblioteca Virtual em Saúde*, BVS), Current Nursing and Allied Health Literature (CINAHL), Web of Science, via EBSCOhost and Scopus. The initial sample consisted in 805 publications.

The combinations of the controlled and uncontrolled terms of the health area applied to the databases are presented in Figure 1.

Medline® / PubMed®	((Ambulatory Surgical Procedures[mh] OR Ambulatory Surgical Procedure*[tiab] OR Ambulatory Surger*[tiab] OR Ambulatory Operation*[tiab] OR Outpatient Surger*[tiab] OR Outpatient Operation*[tiab] OR Office Surger*[tiab] OR Office Operation*[tiab] OR Day Surger*[tiab]) AND (Cancellation*[tiab] OR Cancel*[tiab] OR Suspension*[tiab])) NOT (Child*[ti] OR Teen*[ti] OR Adolescent*[ti] OR Pediatric*[ti] OR Paediatric*[ti])	185
Embase	('ambulatory surgery'/exp OR 'ambulant surgery':ti,ab OR 'ambulatory surgery':ti,ab OR 'ambulatory surgical procedures':ti,ab OR 'day surgery':ti,ab OR 'outpatient surgery':ti,ab OR 'surgery, ambulatory':ti,ab OR 'outpatient operation*':ti,ab OR 'ambulatory operation*':ti,ab OR 'office surger*':ti,ab OR 'office operation*':ti,ab) AND (cancellation* OR cancel* OR 'suspension'/exp OR 'suspension':ti,ab OR 'suspensions':ti,ab) NOT (child*:ti OR teen*:ti OR adolescent*:ti) AND [embase]/lim NOT ([embase]/lim AND [medline]/lim)	196
BVS / Lilacs	("Ambulatory Surgical Procedure" OR "Ambulatory Surgical Procedures" OR "Ambulatory Surgery" OR "Ambulatory Surgeries" OR "Ambulatory Operation" OR "Ambulatory Operations" OR "Outpatient Surgery" OR "Outpatient Surgeries" OR "Outpatient Operation" OR "Outpatient Operations" OR "Office Surgery" OR "Office Surgeries" OR "Office Operation" OR "Office Operations" OR "Day Surgery" OR "Day Surgeries" OR "Cirurgia Ambulatorial" OR "Cirurgia de Dia" OR "Cirurgia do Paciente Externo" OR "Cirurgia no Consultório" OR "Procedimentos Cirúrgicos Ambulatoriais" OR "Cirugía Ambulatoria" OR "Cirugía en el Consultorio" OR "Procedimientos Quirúrgicos Ambulatorios") AND (Cancellation* OR Cancel* OR Suspension* OR Suspensão OR Suspensões OR Suspension*) AND (db:("LILACS"))	20
Cinahl	("Ambulatory Surgical Procedure" OR "Ambulatory Surgical Procedures" OR "Ambulatory Surgery" OR "Ambulatory Surgeries" OR "Ambulatory Operation" OR "Ambulatory Operations" OR "Outpatient Surgery" OR "Outpatient Surgeries" OR "Outpatient Operation" OR "Outpatient Operations" OR "Office Surgery" OR "Office Surgeries" OR "Office Operation" OR "Office Operations" OR "Day Surgery" OR "Day Surgeries") AND (Cancellation* OR Cancel* OR Suspension*)	50
Web of Science	TS=("Ambulatory Surgical Procedure" OR "Ambulatory Surgical Procedures" OR "Ambulatory Surgery" OR "Ambulatory Surgeries" OR "Ambulatory Operation" OR "Ambulatory Operations" OR "Outpatient Surgery" OR "Outpatient Surgeries" OR "Outpatient Operation" OR "Outpatient Operations" OR "Office Surgery" OR "Office Surgeries" OR "Office Operation" OR "Office Operations" OR "Day Surgery" OR "Day Surgeries") AND TS=(Cancellation* OR Cancel* OR Suspension*) NOT TI=(Child* OR Teen* OR Adolescent* OR Pediatric* OR Paediatric*)	108
Scopus	TITLE-ABS-KEY("Ambulatory Surgical Procedure" OR "Ambulatory Surgical Procedures" OR "Ambulatory Surgery" OR "Ambulatory Surgeries" OR "Ambulatory Operation" OR "Ambulatory Operations" OR "Outpatient Surgery" OR "Outpatient Surgeries" OR "Outpatient Operation" OR "Outpatient Operations" OR "Office Surgery" OR "Office Surgeries" OR "Office Operation" OR "Office Operations" OR "Day Surgery" OR "Day Surgeries") AND TITLE-ABS-KEY(Cancellation* OR Cancel* OR Suspension*) AND NOT TITLE(Child* OR Teen* OR Adolescent* OR Pediatric* OR Paediatric*)	246

FIGURE 1: Controlled and uncontrolled terms of the health area. Rio de Janeiro, RJ, Brazil, 2021.

The Rayyan® software, developed by the Qatar Computing Research Institute (QCRI), was used in the third stage to assist in organization and selection of the articles¹². After applying the eligibility criteria, two reviewers read the titles and abstracts blindly and without interferences in order to avoid bias. In the consensus meeting, both reviewers analyzed the conflicts, with selection of 187 studies for full-reading. Eventually, 13 studies were included in this review. The Flowchart corresponding to the selection process is presented in Figure 2.



Font: adapted from Page et al.¹⁰.

FIGURE 2. Flowchart of the selection process for the studies. Adapted from PRISMA¹⁰. Rio de Janeiro, RJ, Brazil, 2021.

A critical and detailed evaluation of the studies selected was performed in the fourth stage. From this first evaluation, in the fifth stage, a matrix was built in an *Excel* spreadsheet, in which the main data of the articles used in the study were included, such as: authors, year, country, database, search source, method, objective, causes of outpatient surgery cancellations, study setting, canceled specialties, the cancellation rate presented and levels of evidence defined in line with what was suggested in the study¹³.

According to the research design, the levels of evidence can be classified from I to VI. Controlled and randomized clinical meta-analysis studies are found at level I; at level II, individual studies with an experimental design; at level III, evidence from quasi-experimental studies; descriptive studies (non-experimental) or qualitative studies are classified as level IV; case studies or experience studies are level V; and evidence based on experts' opinion is level VI¹³.

The review results were analyzed in the sixth stage, highlighting the main information of the studies that clearly indicated the reasons for outpatient surgery cancellations.

RESULTS

A total of 13 (100%) scientific productions were selected, which are presented in the adapted Prisma¹⁰ flowchart in Figure 2. The publications were identified in the following databases: Embase (n=5) (38.46%)¹⁴⁻¹⁸, Scopus (n=4) (30.76%)¹⁹⁻²², Medline/PubMed (n=2) (15.38%)^{23,24}, CINAHL (n=1) (7.69%)²⁵ and Web of Science (n=1) (7.69%)⁵. Regarding the origin of the publications, the highest number was noticed from Spain (n=6) (46.15%)^{17,19-23}, followed by Nigeria (n=2) (15.38%)^{15,18} and United States of America (n=2) (15.38%)^{16,24}. Brazil¹⁴, the United Kingdom²⁵ and Argentina⁵ contributed one publication each (7.69%).

The productions selected were organized (Figure 3) in chronological order of publication with the following information: authors, year (ascending order), country, objective, method, specialty, cancellation rate, cancellation causes and level of evidence.

Authors/Year/Country	Cancellation rate	Cancellation causes	Level of Evidence
Lira et al, 2002, Brazil ¹⁴	7.20%	Arterial hypertension, acute bronchitis and hemorrhagic complications due to the anesthesia.	IV
Singh et al, 2005, United Kingdom ²⁵	19.90%	Patient failed to arrive, patient unfit, surgery not needed and insufficient room time.	IV
Cortiñas et al, 2006, Spain ¹⁹	6.39%	Locus change, scheduling error, lack of instruments and incorrect preparation, among others.	IV
Dakum et al, 2006, Nigeria ¹⁵	15.6%	Patient not present, inadequate material, power failure, strike, financial problems and pregnancy.	IV
Lee et al, 2008, United States ¹⁶	From 3.0% to 3.9%	Self-reported illness, non-attendance and non-compliance with fasting, among others.	IV
Cortinas-Saenz et al, 2009, Spain ²⁰	1.92%	Blockage in the upper respiratory tract and patient non-attendance.	IV
Herce et al, 2011, Spain ²¹	7.84%	Blockage in the upper respiratory tract and patient non-attendance.	IV
Cortiñas Saenz et al, 2012, Spain ²²	6.74%	Changes in the referrals, scheduling errors, lack of equipment and inadequate preparation, among others.	IV
Córdoba et al, 2013, Spain ²³	4%	Programming error, lack of instruments, lack of time and non-attendance, among others.	IV
Smith et al, 2018, United States ²⁴	0.50%	Hospitalization before the scheduled surgery, fever, preoperative infection and blood-related disorders, among others.	IV
Gallego-Delgado et al, 2019, Spain ¹⁷	4%	Hospital admission for another cause and non-attendance.	IV
Brahin et al, 2020, Argentina ⁵	From 9.21% to 3.31%	Non-attendance and administrative/organizational problems.	IV
Malizu et al, 2021, Nigeria ¹⁸	25.4%	Lack of room space, power failure and defective anesthesia machine, among others.	IV

FIGURE 3. Synthesis of the main information of the studies. Rio de Janeiro, RJ, Brazil, 2021.

The years of publication ranged from 2002 to 2021, with one (7.69%) study published in 2002¹⁴, one (7.69%) in 2005²⁵, two (15.38%) in 2006^{15,19}, one (7.69%) in 2008¹⁶, one (7.69%) in 2009²⁰, one (7.69%) in 2011²¹, one (7.69%) in 2012²², one (7.69%) in 2013²³, one (7.69%) in 2018²³, one (7.69%) in 2019¹⁷, one (7.69%) in 2020⁵ and one (7.69%) in 2021¹⁸.

The objectives of the studies ranged from addressing the reasons for cancellation in elective outpatient surgeries (n=2)^{15,25} and evaluating the results of an outpatient program (n=2)^{19,22}, followed by: verifying possible associations between cancellation of the surgery, preoperative exams and systemic diseases (n=1)²⁴; assessing differences in surgery cancellations at 30-day, 7-day, and 24-hour reassessment intervals (n=1)¹⁶; knowing the characteristics of the population, results and the anesthetic and surgical incidences of an outpatient surgery protocol (n=1)²⁰; describing the preliminary results of a Telemedicine system aimed at pre-surgical management of dental pathology (n=1)²¹; presenting the results obtained from the analysis of data from patients undergoing surgery (n=1)²³; quantifying the frequency and reasons for same-day cancellation of outpatient surgeries (n=1)²⁴; performing a descriptive analysis of the activity performed, assessing care quality and determining the cost-effectiveness ratio of a Cardiology day hospital (n=1)¹⁷; analyzing the experience of the outpatient surgery unit (n=1)⁵ and determining the scope, safety and outcome of orthopedic surgery and identifying potential intervention areas (n=1)¹⁸.

Regarding the research method adopted, it was verified that 100% of the studies (n=13) were observational^{5,14-25}. In the analysis of the level of evidence, all the studies were classified as level IV, as suggested in a paper that classifies descriptive (non-experimental) or qualitative studies as level IV¹³.

Among the studies selected, the Ophthalmology^{14,24,25} and Dermatology²²⁻²⁴ specialties are the most cited, followed by General Surgery^{5,24}, Otolaryngology^{16,25}, Orthopedics^{18,24}, Urology^{15,24}, Cardiology¹⁷, Proctology²⁴, Plastic Surgery²⁴, Gynecology²⁴, Oral and Maxillofacial Surgery²¹ and Dentistry²⁰.

Six (46.15%) of the studies were carried out in university hospitals^{14,18,19,21,23,24}, with variation in the cancellation rate across the countries, with the highest cancellation rates in Nigeria with 25.40%¹⁸ and the United Kingdom with 19.90%²⁵. The United States presented the lowest cancellation rate (0.5%)²⁴, followed by Spain (1.92%)²⁰.

According to the thematic analysis of the studies included in this review, they were grouped into three categories of reasons for outpatient surgery cancellations, namely: a) patient factors, b) clinical factors and c) institutional factors²⁴.

The following stood out among the reasons for cancellation resulting from “patient factors”: patient non-attendance^{5,15-21,23,25}, refusal or withdrawal from the intervention^{19,21-24}, violations of preoperative instructions^{16,24}, alternative anesthesia desired by the patient²⁴, excessive patient movement²⁴, unaccompanied patient²⁴, patient did not want sedation²⁴, financial problems¹⁵ and lack of written consent¹⁶.

The following stood out among the reasons for cancellation classified as “clinical factors”: surgery not necessary^{16,19,22-25}, difficult respiratory tract^{19,25}, infection^{16,24}, fever^{16,24}, pregnancy^{15,16}, metabolic disorders^{15,16}, arterial hypertension^{14,24}, respiratory disease such as acute bronchitis¹⁴, Asthma and Chronic Obstructive Pulmonary Disease (COPD)^{16,24}, refusal of the anesthesia service^{19,23}, positive test for cocaine¹⁶, hospital admission for another cause¹⁷, heart disease²⁴, bleeding complications due to the anesthesia¹⁴, significant weakness²⁴, *delirium tremens*¹⁶, underlying disorder²², self-reported illness¹⁶, intercurrent illness¹⁹, vagal vase episode²⁴, additional preoperative examination required²⁴, hypotension and hyposaturation in anesthetic induction²⁴, hospital admission before the scheduled surgery²⁴, anatomical failure²⁴, lack of intravenous access²⁴, retrobulbar hematoma¹⁹, hematological disorders²⁴, unfit patient²⁵ and surgical scheduling in a non-ambulatory unit¹⁶.

The following stood out among the reasons for cancellation classified as “institutional factors”: lack or failure of equipment^{14,17,21-23}, lack of room time^{17,18,21,25}, programming or scheduling error^{16,19,22,23}, energy failure^{15,18}, incorrect preparation^{19,22}, lack of instruments^{14,18}, strike¹⁵, absence of medical professional¹⁹, surgeon's lack of time¹⁸, lab result unavailability¹⁸, complications²³, inappropriate material¹⁵, change of location¹⁹, changes in referrals²² and lack of medical authorization¹⁶.

As a research limitation, we highlight the possibility that some relevant study may have not included in the search, despite the evaluation made by a librarian, due to the lack - to that moment - of a specific controlled term for “surgery cancellation”.

In view of the countless causes that lead to surgery cancellation, in this study it was decided to discuss the main causes inherent to all three categories of factors: patient, clinical and institutional.

DISCUSSION

Surgery cancellation is a quality indicator that can be related to inefficiency in the processes, a frequent phenomenon observed in health institutions, which can be a source of dissatisfaction, emotional distress and harms²⁶.

As a result, identifying the cancellation rate is fundamental and has been an aspect evaluated by several researchers in the health area for revealing a quality indicator and proposing improvements; thus, an imperative tool in qualified care for the management, with the implementation of initiatives aimed at care quality, although the literature does not point to any acceptable value for these rates¹.

Consequently, proper recording of the cancellation causes plays an important role in terms of organization and administration of resources, as well as for the evaluation of quality indicators^{22,23}. However, it was observed that some studies did not present the reasons for the cancellations, with information loss of up to 20% of the records^{16,24,25}.

Consequently, the multiprofessional effort becomes important to ensure that the records are always updated and that the reasons for surgery cancellations are clearly indicated²⁵.

However, it is noted that the cancellation rates identified were diverse and multifactorial, influenced by different variables, such as: characteristics of the unit, surgical specialties and sociodemographic data of the population served, as in studies of an outpatient surgery center of a major academic tertiary-level reference center in the United States, with 0.5%²³, and in an orthopedic hospital in Nigeria, with 25.40%¹⁸.

Ophthalmology and Dermatology were the most frequent specialties in the studies, probably due to the predominance of outpatient surgeries performed within these specialties^{19,22,23}; however, due to conditions such as advanced age and comorbidities, ophthalmology patients are canceled more frequently²⁷.

In relation to the factors related to the “patient”, not attending the locus on the day of the scheduled procedure^{5,16-18,21,23,25} was the reason most indicated in the studies. Several reasons were identified that led the patients to not attend their surgeries, such as: patient dissatisfaction and preference for performing surgical procedures in a tertiary-level hospital²⁸, inadequate preoperative patient preparation⁷, inconvenient date for surgery or appointments²⁹, improvement in health conditions, incorrect scheduling, lack of communication, diseases, social reasons, inability to leave work and patient withdrawal²⁵.

In Nigeria, absenteeism accounted for 57.1% of the outpatient urological surgery cancellations, with financial difficulties^{15,18} identified as important causal factors.

A study developed in 2020, which attributed the patient's absence to information failures, reduced the cancellation rate from 8.13% to 3.6%, with the patients attending the hospital 3 days in advance to check their health status, refining selection of the eligible patients⁵. Another study conducted in 2005 recommends a telephone reminder 3 days before the surgery to confirm the patient's intention to attend²⁵.

Home visits by nurses can help determine the reasons for patient absence, although this is a difficult strategy to implement in developing countries, with Telemonitoring being an effective way to ensure adequate communication and provide adequate advice to the patients¹⁵. Family involvement was identified as responsible for only one patient not having attended surgery in an outpatient oral surgery program at a Spanish public hospital, which had a cancellation rate of 1.92%²⁰.

Among the “clinical factors”, surgery not necessary^{16,19,22-25}, difficult respiratory tract^{19,24}, infection^{16,24}, fever^{16,24}, pregnancy^{15,16}, metabolic disorders^{16,24}, arterial hypertension^{14,24}, refusal of the anesthesia service^{19,23}, and respiratory diseases such as asthma¹⁶, acute bronchitis¹⁴ and chronic obstructive pulmonary disease (COPD)¹⁵ were the most reported conditions that culminated in surgery cancellations.

From this perspective, adequate communication with the patient to clarify their doubts is indispensable, as lack of knowledge about the surgical process can exacerbate the state of stress and anxiety, reflecting in organic manifestations of diseases that already existed³⁰.

Normally, outpatient surgeries are performed in healthy patients with no significant pathologies²². However, it is important to assess their overall health status and their previous history, as the main concern is their health. Thus, the preoperative evaluation allows improving the ability to adapt the patients' condition from the investigation of their health problems and allowing substitution of sick patients or those unable to be operated on by other patients on the waiting list before scheduling^{3,31}.

Patient safety does not depend on the fact that the intervention is performed in a hospital or outpatient setting, but on adherence to strict patient selection principles²². Some institutions allow not performing the previous evaluation of a patient if the procedure is low-risk and if the patient has no history of chronic diseases or presents stable chronic illnesses²⁴.

Facilitating patient communication with the unit, and clarifying what actions should be taken if infections are suspected, or other post-surgical complications provided through written information leaflets are strategies that can be used³².

Developing institutional protocols for a detailed preoperative evaluation of the patients is the basis for success in outpatient surgeries^{22,31,33}.

As for the “institutional” factors listed, there is predominance of lack or failure of equipment^{16,19,22-25}, followed by programming or scheduling errors^{16,19,22,23} and restriction or lack of room time^{18,22,23,25}. Lack of equipment and materials can be avoided through suitable planning, with a previous confirmation of the items required for the surgery before scheduling the procedure²⁰. The daily meeting called “chat-map” evidenced a better interaction among the various sectors, solving several problems that used to favor surgery cancellation, such as lack of materials³⁴. Involvement of the central sterile supply department team becomes important in this context³⁵.

Scheduling of the surgeries interferes in the teams' time management, representing a challenge both for administrative and care work. Surgical scheduling errors are reported in several publications^{14,19,22,23}, evidencing organizational failures and showing that strategies must be adopted in a coherent and realistic way to provide a better distribution of operating rooms, through control of the time spent for surgeries, especially in educational

institutions^{1,18,36}, and it is important to consider the professionals' team availability, the equipment and materials to guarantee safe performance of the anesthetic-surgical act³⁶.

With regard to room time, this has been a common cause of cancellations and should be calculated based on complexity of the procedure, the patient's characteristics and the surgeon's skills²⁷. However, in university hospitals, where the teaching activity and the residents' participation exert an influence on length of the interventions, more time should be calculated to perform the procedure²³.

Finally, emphasis is given to nurses, who are historically recognized as the health professionals who best adhere to the quality management principles, with leadership and communication skills, especially with the team of surgeons and anesthesiologists, playing a key role in the strategies to minimize surgery cancellations¹.

Study limitations

Considering the managerial role of perioperative nurses in planning and organization of surgical care, periodic visits to the rooms are strategies used to monitor progress of the procedures, given the imprecision of their duration. Consequently, more updated information about progress of the surgeries is obtained, providing due time to devise new managerial strategies^{37,38}.

CONCLUSION

The current paper achieved the objective proposed by discussing the main reasons for outpatient surgery cancellations. Although the causes are multiple and influenced by several factors, it was evidenced that the patient's absenteeism on the day of the scheduled procedure is the most predominant cause and, in the different studies, the reason for such frequent occurrence was not investigated. Thus, it is shown that care and managerial strategies need to be discussed and applied, in order to promote changes in surgical units.

It is expected that the study will contribute to a broader discussion within the outpatient surgery scenario, in addition to encouraging the production of more publications in different organizational contexts, for the upgrading of quality improvement strategies that can be adapted and implemented, favoring quality management with optimization of human and material resources and, thus, reducing unnecessary inconveniences and costs generated by outpatient surgery cancellations.

REFERENCES

1. Pinheiro SL, Vasconcelos RO, Oliveira JL, Matos FG, Tonini NS, Alves DC. Surgical cancellation rate: quality indicator at a public university hospital. *REME Rev Min Enferm*. 2017 [cited 2022 Sep 16]; 21:e-1014. DOI: <http://www.dx.doi.org/10.5935/1415-2762.20170024>.
2. Díaz-Pérez A, Vega-Ochoa A, Domínguez-Lozano B, Carrillo-González S, González-Puertas J. Factores atribuibles a la cancelación de cirugías programadas. *Cir Cir*. 2020 [cited 2022 Sep 16]; 88(4):489-99. DOI: <https://doi.org/10.24875/ciru.20001008>.
3. Yu K, Xie X, Luo L, Gong R. Contributing factors of elective surgical case cancellation: a retrospective cross-sectional study at a single-site hospital. *BMC Surg*. 2017 [cited 2022 Sep 16]; 17(1):1-8. DOI: <https://doi.org/10.1186/s12893-017-0296-9>.
4. Kubala M, Gardner JR, Criddle J, Nolder AR, Richter GT. Improving Operating Room Efficiency. *Int J Pediatr Otorhinolaryngol*. 2021 [cited 2022 Sep 16]; 144(6):110650. DOI: <https://doi.org/10.1016/j.ijporl.2021.110650>.
5. Brahin FA, Toll E, Zain el Din P, Resina JE. Five-year experience with major ambulatory surgery in a department of general surgery. *Rev Argent Cir*. 2020 [cited 2022 Sep 16]; 112(4):469-79. DOI: <http://dx.doi.org/10.25132/raac.v112.n4.1474.ei>.
6. Tan AL, Chiew CJ, Wang S, Abdullah HR, Lam SS, Ong ME, et al. Risk factors and reasons for cancellation within 24 h of scheduled elective surgery in an academic medical centre: A cohort study. *Int J Surg*. 2019 [cited 2022 Sep 16]; 66:72-8. DOI: <https://doi.org/10.1016/j.ijso.2019.04.009>.
7. Herrera-Usagre M, Santana V, Burgos-Pol R, Oliva JP, Sabater E, Rita-Acosta M, et al. Effect of a mobile app on preoperative patient preparation for major ambulatory surgery: protocol for a randomized controlled trial. *JMIR Res Protoc*. 2019 [cited 2022 Sep 16]; 8(1):e10938. DOI: <https://doi.org/10.2196/10938>.
8. Brasil. Ministério da Saúde. Tecnologia da Informação a Serviço do SUS-DATASUS. Brasília, DF: Ministério da Saúde; 2022 [cited 2022 Jan 28]. Available from: <http://tabnet.datasus.gov.br>.
9. Sousa LM, Marques-Vieira CM, Severino SS, Antunes AV. A metodologia de revisão integrativa da literatura em enfermagem. *RIE*. 2017 [cited 2022 Sep 16]; 21(2):17-26. Available from: <http://hdl.handle.net/20.500.12253/1311>.
10. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021 [cited 2022 Sep 16]; 372(71):1-9. DOI: <https://doi.org/10.1136/bmj.n71>.
11. Sousa LM, Marques JM, Firmino CF, Frade F, Valentim OS, Antunes AV. Modelos de formulação da questão de investigação na prática baseada na evidência. *RIE*. 2018 [cited 2022 Sep 16]; 52(23):31-9. Available from: <http://hdl.handle.net/20.500.12253/1287>.

12. Johnson N, Phillips M. Rayyan for systematic reviews. *J Electron Resour Librariansh*. 2018 [cited 2022 Sep 16]; 30(1):46-8. DOI: <https://doi.org/10.1080/1941126X.2018.1444339>.
13. Souza MT, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer. *einstein (São Paulo)*. 2010 [cited 2022 Sep 16]; 8(1):102-6. DOI: <https://doi.org/10.1590/s1679-45082010rw1134>.
14. Cortiñas M, Martínez L, Granados JM, Puerto N, Méndez M, Lizán-García M, et al. Resultados de un programa de cirugía mayor ambulatoria en oftalmología. *Arch Soc Esp Oftalmol*. 2006 [cited 2022 Sep 16]; 81(12):701-8. Available from: http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0365-66912006001200006&lng=es.
15. Cortiñas-Saenz M, Martínez-Gomez L, Roncero-Goig M, Saez-Cuesta U, Ibarra-Martin M. Results of a major ambulatory oral surgery program using general inhalational anesthesia on disabled patients. *Med Oral Patol Oral Cir Bucal*. 2009 [cited 2022 Sep 16]; 14(11):e605-11. DOI: <https://doi.org/10.4317/medoral.14.e605>.
16. Herce J, Lozano R, Salazar CI, Rollon A, Mayorga F, Gallana S. Management of impacted third molars based on telemedicine: a pilot study. *J Oral Maxillofac Surg*. 2011 [cited 2022 Sep 16]; 69(2):471-5. DOI: <https://doi.org/10.1016/j.joms.2010.09.004>.
17. Cortiñas Saenz M, Sáenz Guirado S, Gamez Moreno J, Iglesias Cerrillo JA, Pardo Martínez A, Martínez Gomez L. Análisis de resultados, índices de calidad y complicaciones extrahospitalarias de un programa de cirugía ambulatoria en Dermatología. *Actas Dermo-Sifiliogr*. 2012 [cited 2022 Sep 16]; 103(1):36-43. DOI: <https://doi.org/10.1016/j.ad.2011.04.008>.
18. Córdoba S, Caballero I, Navalón R, Martínez-Sánchez D, Martínez-Morán C, Borbujo J. Análisis de la actividad quirúrgica realizada en el Servicio de Dermatología del Hospital Universitario de Fuenlabrada (2005-2010): establecimiento de los tiempos quirúrgicos estándar. *Actas dermo-sifiliogr*. 2013 [cited 2022 Sep 16]; 104(2):38-43. DOI: <https://doi.org/10.1016/j.ad.2012.05.005>.
19. Gallego-Delgado M, Villacorta E, Valenzuela-Vicente MC, Walias-Sánchez Á, Ávila C, Velasco-Cañedo MJ, et al. Start-up of a Cardiology Day Hospital: Activity, Quality care and cost-effectiveness analysis of the first year of operation. *Rev Esp Cardiol*. 2019 [cited 2022 Sep 16]; 72(2):130-7. DOI: <https://doi.org/10.1016/j.rec.2018.04.005>.
20. Dakum N, Ramyil V, Misauno M, Ojo E, Ogwuiche E, Sani A. Reasons for cancellations of urologic day care surgery. *Níger J Surg Res*. 2006 [cited 2022 Sep 16]; 8(1):30-3. DOI: <https://doi.org/10.4314/njsr.v8i1.54812>.
21. Malizu EV, Lasebikan OA, Omoke NI. Orthopedic day-case surgery in nigeria: A single-center experience. *Ann Afr Surg*. 2021 [cited 2022 Sep 16]; 18(1):52-8. DOI: <http://dx.doi.org/10.4314/aas.v18i1.10>.
22. Lee SL, Taliencio S, Ata A, Clayton J, Parnes SM. Utility of history and physical updates for ambulatory otolaryngic surgery. *Laryngoscope*. 2008 [cited 2022 Sep 16]; 118(1):165-8. DOI: <http://doi.wiley.com/10.1097/MLG.0b013e3181565989>.
23. Smith BB, Smith MM, Hyder JA, Mauermann WJ, Warner ME, Licatino LK, et al. Same-day cancellation in ambulatory surgery a retrospective review at a large academic tertiary referral center. *J Ambul Care Manage*. 2018 [cited 2022 Sep 16]; 41(2):118-27. DOI: <https://doi.org/10.1097/JAC.0000000000000226>.
24. Lira RP, Covolo GA, Monsanto AR, José NK, Arieta CE. Influence of preoperative testing on cancellation of ambulatory cataract surgery in adults. *Am J Ophthalmol*. 2002 [cited 2022 Sep 16]; 34(3):203-5. DOI: <https://doi.org/10.1007/s12009-002-0024-6>.
25. Singh G, Agha R, Roberts D. Cancellations in day-case ENT surgery. *Ambul Surg*. 2005 [cited 2022 Sep 16]; 12(2):57-60. DOI: <https://doi.org/10.1016/j.ambur.2005.05.002>.
26. Muñoz-Caicedo A, Perlaza-Cuero LA, Burbano-Álvarez VA. Causas de cancelación de cirugía programada en una clínica de alta complejidad de Popayán, Colombia. *Rev Fac Med*. 2019 [cited 2022 Sep 16]; 67(1):17-21. DOI: <https://doi.org/10.15446/revfacmed.v67n1.66648>.
27. Da'Ar OB, Al-Mutairi T. How do patient demographics, time-related variables, reasons for cancellation, and clinical procedures affect frequency of same-day operating room surgery cancellation? A maximum likelihood method. *BMC Health Serv Res*. 2018 [cited 2022 Sep 16]; 18(1):1-9. DOI: <https://doi.org/10.1186/s12913-018-3247-y>.
28. Appavu ST, Al-Shekaili SM, Al-Sharif AM, Elawdy MM. The burden of surgical cancellations and no-shows: quality management study from a large regional hospital in Oman. *Sultan Qaboos Univ Med J*. 2016 [cited 2022 Sep 16]; 16(3):e298-302. DOI: <https://doi.org/10.18295/squmj.2016.16.03.006>.
29. Dobarro BA, Aviñón RC, Leal Ruiloba MS, Vázquez Lima A, Ojea Cendón M, Fernández García N, et al. Retrospective analysis of suspended surgeries and influencing factors during an 8-year period. *Cirugía Española (English Edition)*. 2019 [cited 2022 Sep 16]; 97:213-21. DOI: <https://doi.org/10.1016/j.cireng.2019.03.019>.
30. Costa ED, Jacob KC, Silva LB, Gomes IV, Serrano SQ. Suspensão de cirurgias eletivas: visão crítica do paciente. *Rev Enferm UFPE on line*. 2021 [cited 2022 Sep 16]; 15(2):e247344. DOI: <https://doi.org/10.5205/1981-8963.2021.247344>.
31. Lee JH. Anesthesia for ambulatory surgery. *Korean J Anesthesiol*. 2017 [cited 2022 Sep 16]; 70(4):398-406. DOI: <https://doi.org/10.4097/kjae.2017.70.4.398>.
32. Hänninen-Khoda L, Koljonen V, Ylä-Kotola T. Patient-related reasons for late surgery cancellations in a plastic and reconstructive surgery department. *JPRAS Open*. 2018 [cited 2022 Sep 16]; 18:38-48. DOI: <https://doi.org/10.1016/j.jpra.2018.08.002>.
33. Lee DJ, Ding J, Guzzo TJ. Improving operating room efficiency. *Curr Urol Rep*. 2019 [cited 2022 Sep 16]; 20(60):28. DOI: <https://doi.org/10.1007/s11934-019-0895-3>.
34. Tamiaso RS, Santos DC, Fernandes VD, Ioshida CA, Poveda VB, Turrini RN. Quality management tools as strategies for reducing surgery cancellations and delays. *Rev SOBECC*. 2018 [cited 2022 Sep 16]; 23(2):96-102. DOI: <https://doi.org/10.5327/Z1414-4425201800020007>.
35. Huynh E, Klouche S, Martinet C, Le Mercier F, Bauer T, Lecoœur A. Can the number of surgery delays and postponements due to unavailable instrumentation be reduced? Evaluating the benefits of enhanced collaboration between the sterilization and orthopedic surgery units. *Orthop Traumatol Surg Res*. 2019 [cited 2022 Sep 16]; 105(3):563-8. DOI: <https://doi.org/10.1016/j.otsr.2019.01.012>.



36. Gonçalves RC, Sé AC, Tonini T, Figueiredo NM, Hernández PE, Fernandez BM. Surgical suspension rate: assistance quality indicator. *Rev SOBECC*. 2020 [cited 2022 Sep 16]; 25(2):67-74. Available from: <https://revista.sobecc.org.br/sobecc/article/view/548>.
37. Wiyartanti L, Lim CH, Park MW, Kim JK, Kwon GH, Kim L. Resilience in the surgical scheduling to support adaptive scheduling system. *Int J Environ Res Public Health*. 2020 [cited 2022 Sep 16]; 17(10):2–19. DOI: <https://doi.org/10.3390/ijerph17103511>.
38. Silva BR, Leal LA, Soares MI, Resck ZM, Silva AT, Henriques SH. <http://dx.doi.org/10.12957/reuerj.2021.61461>. *Rev Enferm UERJ*. 2021 [cited 2022 Sep 16]; 29:e61461. DOI: <http://dx.doi.org/10.12957/reuerj.2021.61461>.