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ORIGINALES

Cancellations of elective surgeries in a teaching hospital: causes and statistics

Cancelamento de cirurgias eletivas em hospital escola: causas e estatísticas
Cancelaciones de cirugías electivas en un hospital escuela: causas y estadísticas

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ABSTRACT:

Objective: To investigate the suspension rates and reasons for cancellation of elective surgery in a teaching hospital in Rio Grande do Norte.
Methods: A descriptive, retrospective, quantitative study, with documentary analysis of the records filed in the computerized system of the Surgical Center unit of Onofre Lopes University Hospital, from April 2015 to April 2016.
Results: Of the 8.622 (100%) scheduled surgeries for the surveyed period, 74.2% were performed and 25.8% canceled. Among the canceled surgeries (2.227), most cancellations were made by General Surgery (37.5%) and Urology (21.6%). The main reasons for cancellations were included in the categories related to the following aspects: unit's organization (34.4%); related to human resources (27.1%); patient-related (6.5%); related to materials and equipment (6.2%), without justification (5.5%) and conditional surgery (0.3%).
Conclusions: The study identified the cancellations causes of elective surgeries in a teaching hospital, contributing to the improvement of professional performance. This may contribute to reduce the number of suspensions, considering that most reasons for cancellation are preventable.

Keywords: Surgical specialties; Surgery cancellation; Hospital surgical center; Elective surgical procedures.

RESUMO:

Objetivo: Investigar as taxas de suspensão e motivos de cancelamento de cirurgias eletivas em um hospital escola do Rio Grande do Norte.
Métodos: Estudo descritivo, retrospectivo, quantitativo, com análise documental dos registros arquivados no sistema informatizado da unidade do Centro Cirúrgico do Hospital Universitário Onofre Lopes, no período de abril de 2015 a abril de 2016.
Resultados: Das 8.622 (100%) cirurgias programadas para o período pesquisado, 74,2% foram realizadas e 25,8% canceladas. Dentre as cirurgias canceladas (2.227), a maioria dos cancelamentos foram feitos pela cirurgia geral (37,5%) e urologia (21,6%). Os principais motivos de cancelamentos foram inseridos nas categorias relacionados à organização da unidade (34,4%); relacionados a recursos humanos (27,1%); relacionados ao paciente (6,5%); relacionado a materiais e equipamentos (6,2%), sem justificativa (5,5%) e cirurgia condicional (0,3%).
Conclusões: O estudo permitiu identificar as causas de cancelamentos de cirurgias eletivas em um hospital escola, contribuindo para melhoria da atuação profissional frente a problemática, sendo possível reduzir a quantidade de suspensões, considerando que a maioria dos motivos de cancelamento são preveníeis.

Palavras-chave: Especialidades cirúrgicas; suspensões; Centro cirúrgico hospitalar; Procedimentos cirúrgicos eletivos.

RESUMEN:

Objetivo: Investigar las tasas de suspensión y motivos de cancelación de las cirugías electivas en un hospital en Rio Grande do Norte.
Métodos: Estudio descriptivo, retrospectivo, cuantitativo, con análisis documental de los registros archivados en el sistema informatizado MV de la unidad del Centro quirúrgico del Hospital Universitario Onofre Lopes, en el período de abril de 2015 a abril de 2016.
Resultados: De las 8.622 (100%) cirugías programadas para el período investigado, el 74,2% fueron realizadas y el 25,8% canceladas. Entre las cirugías canceladas (2.227), la mayoría de las cancelaciones se hicieron por cirugía general (37,5%) y urología (21,6%). Los principales motivos de cancelación se introdujeron en las categorías relacionadas con la organización de la unidad (34,4%); relacionados con recursos humanos (27,1%); relacionados al paciente (6,5%); relacionado con materiales y equipamientos (6,2%), sin justificación (5,5%) y cirugía condicional (0,3%).
Conclusiones: Este estudio se torna relevante, pues permitió identificar las causas de cancelaciones de cirugías electivas en un hospital de la red pública, contribuyendo para mejorar la actuación profesional frente a la problemática, siendo posible reducir la cantidad de suspensiones, considerando que la mayoría de los motivos de cancelación son prevenibles.

Palabras clave: Especialidades quirúrgicas; suspensiones; Centro quirúrgico hospitalario; Procedimientos quirúrgicos electivos.

INTRODUCTION

The evolution of surgical procedures has occurred over time, especially focusing on patient comfort and well-being. Procedures have become more specific and effective in advancing surgical, instrumentation and anesthetic techniques. Several factors such as daily experience and changes in practices play a significant role in this perspective. However, studies conducted by professionals and researchers in relation to surgical and technological developments, contributed significantly to surgeries that were previously chosen as a last method of treatment, to be performed more often today [(1)]. For that reason, it is important to highlight the managerial work of nurses in the surgery unit, constantly providing the unit of physical, technical and human conditions. This work is essential for assistance to multidisciplinary teams, with a view to qualified service [(2)].

When surgery is needed, in most cases is a difficult and stressful process. It may trigger physiological and/or psychological reactions (neuroendocrine reactions,

anxiety, fear), as well as financial worries, thus modifying the family situation [3]. Therefore, the suspension of elective surgery produces feelings such as frustration and sadness, feelings that are difficult to cope with, which can be aggravated when considering the historical and social construction of each individual. This situation causes the length of stay to increase, causing the patient numerous changes in their daily lives [3].

Surgery cancellation has become a recurring issue not only in Brazil, but in other countries around the world. Surgical movement is considered a variable that interferes with the quality, productivity and efficiency indicators of hospital service management. Since the surgery suspension rate is a parameter of productivity evaluation in the operating room, its analysis aims at improving the quality of care, as well as the rationalization of financial and human resources [1]. Reasons for suspensions include absence or delay of a surgical team member, miscommunication between the medical staff of the surgical center (SC) and/or inpatient units, lack of material and/or supplies needed for surgery, failures in preoperative preparation such as prolonged fasting or lack of fasting, physiological alterations, lack of laboratory tests, among others [3].

Regarding the communication of the surgical suspension to the patient, it is noticeable the related discomfort. In order to soften such attitude, it is necessary that the communication between the team and the patient and between the surgical team itself is effective. It is also important to show consideration and empathy towards the patient. Consulting the patient about the care provided is also important, paying attention to doubts and questions [4]. It is worth highlighting the relevance of interdisciplinary healthcare team communication, as a factor of quality and safety in the services provided to the patient [5].

Surgery cancellation leads to loss of opportunity to include another patient, under-utilization of operating rooms, increased length of stay, risk of nosocomial infection with consequent increase in costs per bed/day, decreased availability of hospital beds, waste of sterilized material, unnecessary work of personnel involved in the preparation of the operating room and the sterilization process, adding possible financial losses [6].

When cancellation occurs prior to the patient's removal from his/her daily activities and admission, the emotional impact and costs may be less. Surgeries, which are canceled on the scheduled day or after the patient's admission to the surgical center, lead to increased hospital costs and loss of operating room hours. The repercussions of the cancellation unfavorably affect the user, causing a confidence loss with the institution, which contributes to the decrease in the quality of care [7].

This research becomes relevant because it allows the evaluation of data related to the suspensions of elective surgeries, knowing the main reasons that led to cancellations. Given the above, it can be seen that surgical cancellation interferes with work processes and the institution itself, as it reduces the quality of service standards and increases hospital costs. For healthcare professionals it can generate physical attrition and occupational stress. For patients, it can influence their emotional state, as well as interfere with preoperative preparation and health condition. Based on this scenario, it is important to know the reasons for cancellation of elective surgery. Thus, the aim of the present study is to investigate the suspension rates and reasons for cancellation of elective surgery in a teaching hospital.

MATERIAL AND METHODS

This is a descriptive retrospective study with a quantitative approach, with documentary analysis of the records filed in the computerized MV system, of the Surgical Center unit of the Onofre Lopes University Hospital (OLUH), a teaching hospital linked to the Federal University of Rio Grande do Norte (FURN), which develops human resources training, research, extension and assistance activities, being a member of the Public Health System and a reference in high complexity in several areas for the entire state of Rio Grande do Norte.

The research was conducted in May 2016 and took as reference the records of all scheduled surgical procedures from April 2015 to April 2016. The sample consisted of the canceled and performed surgeries during this period.

Data collection was performed using data from the computerized system of the surgical center (MV System). Every month, a report of canceled and performed surgeries was issued, which contained information regarding the reasons for cancellation, date, surgical procedure and service provider. To organize the data, a structured form was elaborated with data related to the causes of surgical cancellations, specialty and the moment in which they occurred. The causes of surgery cancellations were classified into categories, which are related as follows: material and equipment, patient, unit organization, human resources and without justification.

For data evaluation, a spreadsheet was prepared using the Microsoft Excel software, with the data analyzed using descriptive statistics, with absolute and relative frequencies and surgical suspension indicators, presented in the form of tables and graphs.

Ethical and legal principles were respected, and the study was conducted after favorable opinion (no. 876.246) of the Research Ethics Committee (REC/FURN), under CAAE: 36086414.0.0000.5537. Institutional authorization for access to restricted data is requested, respecting the confidentiality and integrity of the information.

RESULTS

Considering the 8.622 (100.0%) surgeries scheduled from April 2015 to April 2016 at the Onofre Lopes University Hospital, 6.395 surgical procedures were performed (74.2%). A total of 2.227 were suspended (25.8%), according to Table 1. The months of February 2016 (32.2%), April 2016 (31.8%) and March 2016 (31.4%) are highlighted, as the months with the highest cancellations rates in the period studied. July 2015 was the month with the highest number of scheduled surgeries; February 2016 had the lowest number of elective surgery appointments (4.4%), as well as the month with the highest cancellation rate.

Table 1: Rate of performed and suspended surgeries from April 2015 to April 2016. Natal, RN, Brazil, 2016.

MONTHS	PERFORMED		CANCELLED		TOTAL APPOINTMENTS	
	N	%	n	%	n	%
April/2015	483	69.8	209	30.2	692	8.0
May/2015	514	69.3	228	30.7	742	8.6
June/2015	573	74.1	200	25.9	773	9.0
July/2015	671	78.8	180	21.2	851	9.9
August/2015	604	81.8	134	18.2	738	8.6
September/2015	595	78.5	163	21.5	758	8.8
October/2015	558	77.9	158	22.1	716	8.3
November/2015	495	76.0	156	24.0	651	7.6
December/2015	400	73.3	146	26.7	546	6.3
January/2016	390	74.1	136	25.9	526	6.1
February/2016	259	67.8	123	32.2	382	4.4
March/2016	429	68.6	196	31.4	625	7.2
April/2016	424	68.2	198	31.8	622	7.2
TOTAL	6395	74.2	2227	25.8	8622	100.0

According to Table 2, the data are mentioned by suspension rate and medical specialties, exposed monthly during the study period, in which the specialties with greater cancellation rates were the Surgical Clinic unit (37.5%), followed by Urology (21.6%). The lowest rates presented according to specialties were Mastology (0.8%) and Maxillofacial (2.0%).

For the Surgical Clinic unit, the month with the greatest impact was January 2016 with 50.0% of the procedures canceled. It is important to highlight as a generator of influence in this suspension rate, the vacation period of professors and academics of the Federal University of Rio Grande do Norte. The month with the lowest rate was April 2016, with 24.2% of cancellations. Regarding Urology, January 2016 was the month with the lowest rate with an 8.1%. The 0.4% rate, with 8 procedures canceled, is related to surgeries whose medical specialty was not specified. Cardiac surgery remained with low average cancellations throughout the study period, with no cancellations in August 2015, and with a rate of only 0.6% in September of that same year.

Table 2: Surgical suspension rate by surgical specialties from April 2015 to April 2016. Natal, RN, Brazil, 2016.

PERIOD		SURGICAL SPECIALTIES												
		SC*	Urology	Otorhino**	Vascular	PSC***	Thoracic	Pediatrics	Oncology	Neurology Cardiac surgery		Maxillofacial	Mastology	No Information
2015	Apr (n=209)	42.6	20.1	6.7	6.2	3.3	5.3	5.7	2.4	2.4	2.9	2.4	-	-
	May (n=228)	32.9	23.2	8.8	3.5	7.5	4.8	4.4	4.8	1.3	2.2	3.5	-	3.1
	Jun (n=200)	45.0	21.5	6.5	6.5	1.5	3.5	2.5	3.5	3.0	4.0	2.0	0.5	-
	Jul (n=180)	33.9	27.8	13.3	3.9	2.2	2.8	5.0	5.0	3.9	1.7	0.6	-	-
	Aug (n=134)	39.6	19.4	14.2	3.7	2.2	2.2	6.0	2.2	6.7	-	2.2	1.5	-
	Sep (n=163)	33.7	18.4	6.7	11.7	1.8	8.6	5.5	4.3	6.7	0.6	0.6	1.2	-
	Oct (n=158)	39.2	20.9	7.0	9.5	3.8	6.3	1.9	1.3	3.8	2.5	3.2	0.6	-
	Nov (n=156)	42.9	14.7	7.7	4.5	7.1	4.5	4.5	1.9	3.2	1.9	3.2	3.8	-
	Dec (n=146)	45.9	23.3	2.1	5.5	8.2	4.8	0.0	4.1	0.7	2.1	1.4	2.1	-
2016	Jan (n=136)	50.0	8.1	7.4	4.4	10.3	4.4	0.0	6.6	5.9	1.5	0.0	0.7	0.7
	Feb (n=123)	28.5	19.5	9.8	13.0	3.3	4.9	6.5	5.7	3.3	4.1	1.6	-	-
	Mar (n=196)	33.7	23.0	5.6	13.8	5.1	2.0	5.1	3.1	3.6	3.1	1.5	0.5	-
	Abr (n=198)	24.2	33.8	5.6	10.1	7.1	5.1	2.0	3.0	3.5	2.5	2.5	0.5	-
TOTAL	**n**	836	481	171	164	108	101	85	81	79	51	44	18	8
	%	37.5	21.6	7.7	7.4	4.8	4.5	3.8	3.6	3.5	2.3	2.0	0.8	0.4

Nota: * SC: Surgical Clinic Unit; ** Otorhino: Otorhinolaryngology; ***PSC: Pediatric Surgical Clinic.

Table 3 shows that of the 2.227 surgeries canceled in the observed service, the highest cancellation rate was found in the category unit organization with 34.4%. The most prevalent subcategory was error in surgical programming with 17.4%. Inside this subcategory, factors such as scheduling errors (58.1%) and double scheduling (25.3%), were the ones with the greatest impact.

The second highest cancellation rate is in the category related to human resources (27.1%). The subcategory with the highest index was lack of anesthetist (9.7%). The third highest rate is in the patient-related category (26.5%), revealing as the highest rate subcategory, non-attendance (11.1%). The subcategory lack of hospital beds (6.2%), is a problem also related to cancellations after the patient's admission.

Table 3: Cancelling reasons of elective surgeries from April 2015 to April 2016. Natal, RN, Brazil, 2016.

CANCELLING REASONS	n	%
Material and equipment related	**139**	**6.2**
Lack of material and equipment	139	6.2
Patient related	**590**	**26.5**
No attendance	247	11.1
Unfavorable clinical condition	187	8.4
Unprepared patient	106	4.8
Refuse to perform surgery	50	2.2
Related to unit organization	**765**	**34.4**
Error in surgical programming	387	17.4
Lack of hospital beds	138	6.2
Time delay/overlap/surgical time exceeded	135	6.1
Emergency surgery	50	2.2
Previously performed surgery	47	2.1
Lack of operating room	8	0.4
Human resources related	**604**	**27.1**
Lack of anesthetist	216	9.7
Cancellation by surgeon/anesthetist	114	5.1
Lack of surgeon	100	4.5
Date relocation and surgical replacement	85	3.8
Delay of the surgical team	83	3.7
Lack of nursing staff	6	0.3
Unexcused	**7**	**0.3**
Conditional surgery	**122**	**5.5**
TOTAL	**2227**	**100.0**

Noteworthy is the lack of preparation (4.8%), as an important factor related to the preoperative phase, being absence of fasting (30.2%) and problems related to exams (non performed, expired and/or insufficient tests and the need of re-testing) (55.7%), as the main causes that led to the suspension of surgical procedures within this category.

DISCUSSION

The present research reveals a higher rate of cancellation of elective surgeries, almost double, when compared to a study conducted in a Public University Hospital located in the interior of the state of São Paulo [7]. In a study conducted at a public hospital in the state of São Paulo, the rate of suspension of scheduled elective surgeries is approximately one quarter of the presented in the present study [8]. It is noticed that the cancellations rate of the present study, given the rates obtained in other studies, is above average. By analyzing the data revealed, it was identified the need to direct efforts to effectively reduce the cancellations rates presented, taking into account the evidence and parameters showed.

Elective surgery cancellation rates are related to the surgical productivity and patient

care of the surgical services, thus impacting on economics and quality of care [9]. Several problems may arise when cancellation is made after admission, such as loss of opportunity to include another patient, under-utilization of operating rooms, increased length of stay rate, risk of nosocomial infection and decreased availability of hospital beds. Problems such as waste of sterilized material, unnecessary work of staff in the operating room and the sterilization process add up to possible financial losses when there is a cancellation upon admission to the operating room [6].

The emotional impact on the patient after cancellation may generate a broken bond of trust with the institution and/or health professionals, which contributes to the decrease in the quality of care [7]. A documentary study conducted from the electronic database, The Health Black Box, from the Brazilian Medical Association, identified that 74.1% of healthcare related medical records in Brazil result from lack of access to surgical care in all Brazilian regions [10]. Considering the data collected, it is noted the importance to improve and optimize the use of the Surgical Center and the services provided to users.

Accordingly to the rate of performed and suspended surgeries from April 2015 to April 2016, it is possible to view the number of scheduled and canceled surgeries month by month. Throughout the study period, cancellation rates remained high, with a slight decline in August 2015 and a steeper rise in February 2016. There is a variation of 18.2% to 32.2% in the rate of monthly cancellations. To ascertain the causes of an increasing number of cancellations, further research is needed to search for consistent data and identify the cause that generated the high prevalence [1].

Among the medical specialties analyzed during the study, the Surgical Clinic Unit obtained the highest cancellation rate during the analyzed period, followed by Urology. The high rates of completion and suspension of surgeries may be associated with specific characteristics of the unit, which receives high demand for general surgery, in addition to presenting several courses of medical and multiprofessional residency, such as General Surgery and Urology.

The category with the greatest impact on the reasons for surgical cancellations in this study was the unit organization. The main causes of cancellations were administrative, so it is necessary to emphasize that the related reasons are non-clinical and can be modified. A study conducted in a large hospital in Belo Horizonte corroborates this research when it presents an equivalent rate regarding the reasons for cancellations possibly related to administrative factors [1].

A study conducted at the National Institute of Cardiology in the state of Rio de Janeiro, emphasizes the high rate of cancellations due to institutional, administrative and/or logistical problems of the hospital, in which of the 170 suspended surgeries, 119 were related to these reasons [11]. However, a study conducted in Slough, United Kingdom, from January to December 2012 reported that cancellations of surgeries for administrative reasons had a percentage of only 2.29% and the highest cancellation rate (33,73 %) was due to patient-related causes [12].

Organizational problems are among the most frequent reasons for cancellations of elective surgeries in health institutions, including lack of hospital beds, scheduling errors, miscommunication and administrative problems [1].

Lack of hospitalization beds often presents as a problem resulting from cancellations after the patient's admission. In a survey conducted in a hospital in the state of Rio de Janeiro, between February 2012 and December 2012, the highest rates to justify suspensions were: lack of anesthetist (18.2%), hypertensive crises (12.7 %), as well as a high rate of undeclared reasons in medical records (34.5%) [13]. In a public hospital in the city of São Paulo, the causes for suspended surgeries related to the organization of the unit are: priority for urgency and error in surgical programming [14].

Importantly, the double scheduling factor obtained a considerably high value. For human resources category, lack of anesthetist was the subcategory with the highest impact. A study on surgeries cancellation at a university hospital shows that, in countries such as the United States and Norway, the main causes of surgical cancellation are related to institutional problems and human resources, resembling the present study [7].

Regarding patient-related cancellations, especially in the non-attendance subcategory, the present study reveals much lower rates when compared to another research, that has a 31.3% higher rate, and non-attendance is the main reason for cancellations with a 45.2 % higher rate [1]. A multicenter research conducted in 81 German university hospitals points to results that corroborate the present study. It emphasizes that, among the most significant surgical cancellation factors are the ones related to medical reasons and patient's non-admission [15]. However, the lack of material motive was not an impediment to perform surgeries at German university hospitals [15].

In a retrospective study conducted at the Botucatu University Hospital, it was found that in 2009, the patient's non-admission was the main reason for cancellation, followed by a change in medical conduct, exceeded time of another surgeries, and unfavorable clinical conditions to surgery, which resulted in the non-attendance of patients and unfavorable conditions to surgery as major causes of cancellation of surgical procedures. Organizational causes include lack of hospital beds, unavailable medical staff, and scheduling errors [7].

The nursing staff plays an essential role, that may contribute to the perform of scheduled surgeries on the scheduled date, complying all the safety conditions required. Avoiding cancellations of elective surgery focusing on the cooperation of nursing with other professional teams, within an efficient administrative plan, should be one of the goals of nursing and healthcare as a whole, as well as the hospital administrative team. Regarding specifically the surgical patient, several studies identify the relevance of efforts to improve the quality of nursing care [16].

Measures such as the implementation of a control periodic system of the number of surgeries and suspensions causes, as well as material required for surgeries, helps to improve efficiency and decrease the high cancellation rates [6]. When analyzing the problems related to the multiprofessional team, it is emphasized that several cancellations could be avoided, with a primary assessment made by the medical and nursing staffs and the feedback of surgeons regarding the underestimation of time needed to perform surgeries [17].

CONCLUSION

The results showed that the main causes of surgical cancellations were due to factors related to the unit's organization, such as error in surgical programming, lack of hospital beds, and delay/overlapping/excess of surgical time. It is important to highlight the cancellations related to human resources with emphasis on lack of anesthetist, as well as those related to the patient, being non-attendance and unfavorable clinical conditions the main causes of surgical suspension within this category.

Evidently, suspensions of elective surgery are not established solely for administrative reasons, i.e., clinical-related. Thus, in many cases, suspensions are preventable. There are also high incidences regarding the patient such as non-attendance, unfavorable clinical conditions, unprepared patient, and patient's refusal to perform surgery. Although clinical conditions are more difficult to manage and predict, good preoperative assessment and follow-up, along with quality preparation and guidance, based on patient needs, could reduce suspension rates.

The findings of this research demonstrate the need to implement professional awareness programs, so that measures can be taken to reduce the cancellation rates of elective surgery in the institution, which will result in greater patient safety, improved quality of care and less costs and waste production. Therefore, the manager's work should focus on the process of reducing surgical cancellation rates.

Limitations of this research include the lack of some specific information in medical records (not recording the reason for surgery cancellation, cancellations with no declared medical specialty), as well as the use of secondary data. In consequence, it was difficult to analyze the context of the moment, due to the lack of available information. This suggests the need for accurate and detailed information of the data, as well as training and awareness to complete the medical records. It is important that prospective studies addressing this issue be conducted, as well as research and interventions that evaluate the measures adopted and their results in cancellations rates of elective surgery.

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