AN EVALUATION OF THE USE OF SURGICAL INSTRUMENTS IN AN OUTPATIENT SURGERY CENTER

Avaliação da utilização de instrumentais cirúrgicos em um Centro Cirúrgico Ambulatorial

Evaluación de la utilización de instrumentales quirúrgicos en un Centro Quirúrgico Ambulatorio

Adriana Breves dos Santos[1], Lucas Felix Calandrim[1], Joyce Marye Matsuoka Bidurim[1], Raquel Aparecida Gonçalves[1], Cleuza Aparecida Vedovato[2], Ana Paula Boaventura[3]

ABSTRACT: Objective: To evaluate the number of surgical instruments that are used and go unused during surgeries performed at an outpatient surgery center of a university hospital. **Method:** This is a cross-sectional, quantitative, and descriptive study, carried out using a survey of data of observations related to the use or non-use of surgical instruments present in surgical boxes. **Results:** A total of 176 surgeries were observed among the specialties: ophthalmology 132 (75%), otorhinolaryngology 16 (9.09%), plastic surgery 12 (6.81%), and other specialties 16 (9.09%). It was confirmed that 49.10% of the instruments were wasted, as they were not used in the outpatient surgeries. **Conclusion:** This study brings a new perspective about the role of nursing in Outpatient Surgery Centers and responsibility of nurses with regard to the management and control of costs at health institutions.

Keywords: Surgical Instruments, Outpatient Surgical Procedures, Cost control.

RESUMO: Objetivo: Avaliar o número de instrumentais cirúrgicos utilizados e não utilizados durante cirurgias realizadas em um centro cirúrgico ambulatorial de um hospital universitário. **Método:** Trata-se de um estudo transversal, quantitativo e descritivo, realizado a partir do levantamento de dados com a observação da utilização ou não dos instrumentais cirúrgicos presentes nas caixas cirúrgicas. **Resultados:** Foram observadas 176 cirurgias, dentre as especialidades: oftalmologia 132 (75%), otorrinolaringologia 16 (9,09%), plástica 12 (6,81%) e outras especialidades 16 (9,09%). Verificou-se 49,10% de desperdício dos instrumentais, por estes não terem sido utilizados nas cirurgias ambulatoriais. **Conclusão:** Este estudo traz uma nova perspectiva sobre a atuação da enfermagem no Centro Cirúrgico Ambulatorial e sua responsabilidade perante o gerenciamento e controle de custos de uma instituição de saúde.

Palavras-chave: Instrumentos cirúrgicos. Procedimentos cirúrgicos ambulatórios. Controle de custos.

RESUMEN: Objetivo: Evaluar el número de instrumentales quirúrgicos utilizados y no utilizados durante cirugías realizadas en un centro quirúrgico ambulatorio de un hospital universitario. **Método:** Se trata de un estudio transversal, cuantitativo y descriptivo, realizado a partir del levantamiento de datos con la observación de la utilización o no de los instrumentales quirúrgicos presentes en las cajas quirúrgicas. **Resultados:** Fueron observadas 176 cirugías, entre las especialidades: oftalmología 132 (75%), otorrinolaringología 16 (9,09%), plástica 12 (6,81%) y otras especialidades 16 (9,09%). Se verificó un 49,10% de desperdicio de los instrumentales, por estos no haber sido utilizados en las cirugías ambulatorias. **Conclusión:** Este estudio trae una nueva perspectiva sobre la actuación de la enfermería en el Centro Quirúrgico Ambulatorio y su responsabilidad ante la gestión y control de costos de una institución de salud.

Palabras clave: Instrumentos Quirúrgicos, Procedimientos Quirúrgicos Ambulatorios, Control de Costos.

[1]Undergraduate Nursing Students from the School of Nursing at the State University of Campinas (UNICAMP). E-mails: adrianabreves@gmail.com, lucas.calandrim@gmail.com, jbidurim@gmail.com, goncalvesraquel10@gmail.com
[2]Masters in Nursing from the School of Nursing at UNICAMP. E-mail: vedovato@unicamp.br
[3]Professor at the School of Nursing at UNICAMP. E-mail: apboa@unicamp.br
Avenida José Puccinelli, 10 (Rua 6 casa 92) – COSCata–CEP: 13146-000 – Paulínia (SP), Brasil.
Received: 29 Nov. 2016 – Approved: 8 Mar. 2017
DOI: 10.5327/Z1414-4425201700020004

INTRODUCTION

Outpatient surgery around the world is linked to the history of nursing and has become possible with the progressive advances of minimally invasive surgical techniques and anesthetic drugs that enable a patient's rapid recovery with minimal complications[1,2].

The main goal of an outpatient surgery center is to ensure safety at low cost and allow the patient to stay in the hospital for only a short period of time[2].

An Outpatient Surgery Center (OSC) is very similar to a traditional Surgery Center (SC), differing only from the fact that the patient's discharge occurs on the same day of the procedure, allowing for a number of advantages, such as the reduction of anxiety, less risk in contracting hospital infections, reduced recovery time, and economic savings for the hospital[1-2.]

Surgeries that can be performed in the OSC are not very complex, and they use local, regional, block (spinal and/or epidural), or general (inhalational and/or intravenous) anesthetic techniques. Patients should have no systemic impairments due to other diseases or to surgery, will undergo surgical procedures that do not require specific postoperative care, and must have a companion in order to be discharged[1-3].

An important factor to ensure trans-operative nursing care in a SC is the necessary interaction with the Central Sterile Supply Department (CSSD), which provides all the sterilized materials and instruments used in each surgical procedure.

The primary function of the nursing team is to control the use of surgical instruments used within the operating room in order to guarantee the safety of the patient and the medical team, and also ensure that the proposed surgical technique is adequately performed. The nurse receives the material from the CSSD, does an initial check of the instruments present in the room, and, at the end of the surgery, verifies the integrity of the instruments, and returns them for further processing to the CSSD[4-6].

Surgical instruments and other materials used in the hospital environment are considered material resources and represent 75% of the capital of organizations. Therefore, the way in which they are administered directly reflects on the costs of the company[7,8].

The number of material resources, specifically surgical instruments, should be counted by the nurse, allowing for the surgery to happen while avoiding unforeseen consequences, waste, and high costs[7,8].

This study involves important progress in trans-operative nursing care. The patient is rigorously assessed and monitored within the operating room, and the control of all processes and procedures that will be performed in the operating room throughout the surgery, especially the control and evaluation of the instruments and materials that will be used at that time, are the responsibility of the SC nurse[1].

OBJECTIVE

To evaluate the number of surgical instruments that are used and go unused during surgeries performed in the OSC of a university hospital.

METHODS

A quantitative and descriptive study was carried out based on the data collection from the systematic observation of the use or nonuse of surgical instruments present in the surgical boxes.

The study site was the OSC of a university hospital, located in the interior of the state of São Paulo. It has 411 beds at the tertiary and quaternary level, where all services are performed and paid in full by the Public Health System (SUS). The OSC performs on average 600 surgeries per month in eight operating rooms in the areas of ophthalmology, otorhinolaryngology, dermatology, plastic surgery, otolaryngology, neurology, and urology.

The data were collected after analysis and approval from the Ethics Committee of the State University of Campinas under the substantiated report number 1,384,178 dated 06/01/2016. The data collection was authorized by the nursing director of the OSC, and by the nurses responsible for the site, after they explained the research objectives. It was authorized after the reading and signing of the Term of Free and Informed Consent, thus ensuring the ethical and legal principles involved in research with human beings and thus respecting the ethical and legal aspects of Resolution No. 466/2012 of the National Committee for Research on Human Beings.

The data collection instrument consisted of the lists of surgical instruments contained in the surgical boxes of the surgeries performed in the OSC. Some surgeons in specialties such as ophthalmology, used the surgeons' own surgical boxes, which do not have a list. For the collection of data

with regard to surgeries that used unlisted surgical boxes, the number of total instruments in the surgical box and the number of instruments used during the surgery were observed. Surgeries during the second quarter of 2016 were monitored from the beginning to the end for the reliable evaluation of the surgical instruments that were used and went unused.

The data were collected by the researcher, stored in a spreadsheet, put into tables with the aid of the Microsoft Excel® program, and analyzed under statistical guidance.

The sample calculation was performed considering the objective of estimating the proportion of surgical instruments not used in OSC surgeries over a period of three months. The sample calculation considered a proportion *p* equal to 0.50, whose value represents the maximum variability of the binomial distribution, thus generating an estimate with the largest possible sample size.

The population (N) considered for the calculation of the sample size was composed of 1,629 outpatient surgeries, carried out from February to April 2015. In addition, a sampling error of 5% and a significance level of 5% were assumed. Under these conditions, the calculated sample size was 176 surgeries. This sample was divided proportionally according to the number of surgeries performed and the specialties of the surgeries.

RESULTS

The OSC of this hospital performed 7,196 outpatient surgeries in 2016 and 1,659 surgeries in the second quarter of that year, during which the data from this study were collected.

During the data collection period, 176 surgeries were observed, corresponding to 10.6% of the surgeries performed in the second quarter among the specialties: ophthalmology 132 (75%), otorhinolaryngology 16 (9.09%), 12 (6.81%), and other specialties 16 (9.09%), such as otolaryngology (6), dermatology (8), neurology clinic (1), and urology (1).

The number of surgical boxes opened during surgery ranged from 1 to 4, with only one box being used in 145 of the surgeries (82.38%).

In 176 surgeries collected at the OSC, 132 (75%) were ophthalmologic surgeries and an average of 18.17 instruments were used in each surgery. For the otorhinolaryngology surgeries 16 (9.09%), there were on average 40.19 instruments in the operating room.

It is also found (Table 1) that, among these small outpatient surgeries, there are some procedures that require only one instrument and others that require up to 86 instruments.

It was found in Table 2 that otorhinolaryngological surgeries have an average of 27.06 unused instruments, while in the ophthalmology specialty the average of unused instruments is 9.55.

Among the 176 surgeries analyzed, it was found that, on average, 11.67 instruments are not used in outpatient surgeries.

It was also found (Table 3), in this study, that there was an overall average of 49.10% instruments not used in outpatient surgeries.

DISCUSSION

Daily, an OSC performs simple and complex surgical procedures in several different specialties. Perioperative nursing care includes an assessment of the patient's safety costs, and the care given. In addition, it is the responsibility of the nurses, who have ethical and technical skills training, to manage human and material resources [9].

Among the 176 surgeries, it was found that, on an average, there were 21.13 instruments in the operating rooms. There were surgeries that had up to 86 instruments. Considering that there was on average 11.67 unused instruments in general, and up to 27.06 in otorhinolaryngology, we question the high number of these unused instruments present in the operating rooms.

Table 1. Distribution of instruments in the surgical boxes that were used in the Outpatient Surgical Center. Campinas, 2016 (n=176).

Variable	Total Surgeries by Specialty	n	Average	Standard Deviation	Minimum	Maximum
Total Instruments	Ophthalmology	132	18.17	8.46	1	56
	Otolaryngology	16	40.19	21.98	13	86
	Plastic surgery	12	23.83	10.22	8	56
	Others	16	24.44	5.82	12	41
	Total	176	21.13	12.07	1	86

As soon as the surgical box is opened inside the operating rooms – thus exposing the instruments – they must be sent to the CSSD, where they undergo a sterilizing process[6]. Such a process carried out unnecessarily can lead to the wearing off of the material, and also increased costs for the health institution.

This present study demonstrated that, on an average, 49% of surgical instruments are not used during OSC surgeries. This number is considered high because these instruments have to go through the sterilization process again, which accumulates higher costs for the institution. There are expenses on supplies, labor for cleaning, packing, and storing the instruments, in addition to expenses due to water consumption, electricity, and maintenance of the sterilizer[10].

As they are a major investment for the institution, surgical instruments must be used properly in order to maintain their quality and prolong their life. It should be emphasized that health organizations, because of their limited resources and high health care costs, need to find alternative ways to reduce expenditures and increase productivity so as to reduce waste [10-12].

The reasons why these instruments are not used are: in the surgery boxes, which have been previously established by the surgery team, there is an excess number of instruments that are not necessary for the proposed surgical procedure; the simplicity of the outpatient procedures combined with the fast evolution of surgical techniques, has caused many instruments to no longer be used; and lastly, sometimes there is a preference for specific instruments that are not included in the proposed surgery box, and that are extremely specific instruments from a box of another specialty or another member of the surgical team. Thus, it is evident that instruments are not used as often as they could be, entailing unnecessary costs on the institution, especially considering that these costs can be predicted and corrected[13,14].

The nurse is responsible for controlling materials, as well as communicating between units so that there are lower costs when processing the materials. Oftentimes the practice of replacing instruments is time consuming and bureaucratic, resulting in higher costs[14,15].

The CSSD is responsible for ensuring the safe reuse of the instruments, processing them, and also verifying their performance in the specific testing environment in order to ensure greater patient and professional safety[16,17].

It is up to the nurse to research new alternatives and solutions to the problem concerning unused surgical instruments,

Table 2. Distribution of the instruments that were used and went unused in the Outpatient Surgical Center. Campinas, 2016 (n=176).

Variable	Specialty	n	Average	Standard Deviation	Minimum	Maximum
Instruments Used	Ophthalmology	132	8.61	3.74	1	21
	Otolaryngology	16	13.13	8.2	1	32
	Plastic surgery	12	9.5	5.47	3	21
	Others	16	12.69	4.56	5	19
	Total	176	9.45	4.75	1	32
Instruments not used	Ophthalmology	132	9.55	7.51	0	47
	Otolaryngology	16	27.06	16.62	5	64
	Plastic surgery	12	14.33	7.94	4	23
	Others	16	11.75	6.28	2	27
	Total	176	11.67	9.94	0	64

Table 3. Percentage of instruments that were not used in surgeries performed at the Outpatient Surgical Center. Campinas, 2016 (n=176).

Variable	Specialty	n	Average	Standard Deviation	Minimum	Maximum
Percentage of Waste	Ophthalmology	132	46.4	23.28	0	86.67
	Otolaryngology	16	66.49	14.9	38.46	93.75
	Plastic surgery	12	58.35	16.99	33.33	87.5
	Others	16	46.97	19.39	10	78.26
	Total	176	49.1	22.68	0	93.75

with the reduction of unnecessary costs as their primary objective. To this end, it is essential to identify what is being wasted in addition to raise awareness and create behavioral changes among the team that works in the outpatient surgical center. This will be done through continuous education with a focus on the work processes in order to improve and develop professionals with the aim of reducing waste, and creating strategies to minimize it[16,17].

With this goal in mind, we propose a revision of work processes that integrate the OSC and CSSD, as well as involve both the nursing and medical teams, and reformulate the composition of the specific surgical boxes, so that they keep up with the evolution of modern surgical techniques[16,17].

CONCLUSION

The overall average of instruments not used in outpatient surgeries at the surgical center was 49%, and especially in ophthalmology surgeries, most of which used one surgical box per procedure with an average of 21.13 instruments per box. It was found that it is the responsibility of the nurse to manage the material resources in the OSC. He or she impacts cost controls at the institution and also searches for better strategies that aim to improve the work process.

It is important to emphasize the integration of the OSC and CSSD, which would allow for the revision of the instruments contained in the surgical boxes, as well as the design of specific instrument kits for certain procedures or specific individually wrapped instruments.

A limitation of this study was the few publications on this subject in both the national and foreign literature, thus making it difficult to compare results. Therefore, the results found do not apply to all institutions. Even so, the study achieved its objective and stands out because it identified the percentage of wasted surgical instruments, contributed to the revision planning of technical and administrative work processes, and encouraged greater use of surgical instruments, which would reduce costs for health institutions. It also raises new perspectives for future studies on nursing performance in the OSC and its responsibility toward the management and control of material resources in health institutions.

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