

Strategies for Preventing Adverse Events in the Surgical Center

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Abstract— The study aims to identify the strategies used to prevent adverse events in surgical centers. The method used was a systematic literature review, based on the LILACS, MEDLINE, BDNF, Science Direct, PubMed/MEDLINE databases. The following descriptors were crossed: “Medical errors AND Surgical Centers”, “Patient Safety AND Surgical Centers”. 841 publications were found in the databases, of these, 709 were in MEDLINE, 56 in LILACS, 38 in BDNF, 11 in Science Direct and 27 in PubMed. Only 2 articles were included in the review, which included strategies such as: implementing an incident reporting system and a formal event analysis program, perioperative checklist, morbidity and mortality conferences, identification bracelets, training or systematic education in the introduction of new devices. To reduce adverse events, it is necessary to identify them, because the perception of failures in the different phases of care, allows the identification of recurrent errors and a critical assessment for decision making, which contributes to the prevention of subsequent errors and more effective interventions.

Keywords— Medical Errors, Patient Safety, Surgicenters, Accidents Prevention, Comprehensive Health Care.

I. INTRODUCTION

Due to numerous factors, the assistance provided to patients in health care establishments has the potential to cause incidents [1]. Among health incidents, the adverse event is characterized by, necessarily, bringing harm to the patient, resulting from the assistance and which is not related to the prognosis of the underlying disease [2].

A study in 26 countries showed that more than 130 million adverse events (AEs) happen annually in hospitals, leading to 2.5 million deaths a year due to unsafe health care [3,4]. In Brazil, the Surgical Center (SC) is

responsible for 4.11% (N = 3,095) of the total number of incidents recorded in the last Patient Safety and Quality in Health Services Bulletin [5]. The SC is a complex hospital unit, characterized by multiprofessional assistance, and which requires a safe and high quality procedure [6]. An average of 187 to 281 million surgical procedures are performed annually, worldwide. Data demonstrate that for 25 people, 1 will need to undergo this type of procedure, so it is essential that these procedures are done safely, minimizing errors and failures in the assistance process [7,8].

It is estimated that 50% of AEs, associated with surgical interventions, are due to preventable causes, such as, object retention in the patient after the procedure, incorrect limb amputation, emergency medication unavailability, incorrect surgical positioning, and site infections surgical, among others [9-11].

For the patient, these errors result in physical, psychological and financial damages, which are associated with prolonged hospital stay, hospital readmission, additional surgeries and reoperations, irreversible damage, and even death [9, 12].

In view of the magnitude of these problems, international strategies such as the World Alliance for Patient Safety, Global Challenges, the Surgical Safety Checklist (SSC), and national strategies such as the National Patient Safety Program (NPSP), the implantation of Safety System Nuclei (SSNs), and the Brazilian Network of Sentinel Hospitals, among other measures, were created with a focus on improving the quality of patient safety in order to reduce possible incidents and adverse events [8, 12-14].

The concern with the surveillance of the quality of services is relevant, as it strengthens the creation of effective strategies for risk management, and demonstrates the worldwide commitment of health organizations to the theme and the need for supervision and prevention of damage in health care. In addition, for patient safety to be effective, it is necessary to spread a safety culture that recognizes the importance of quality management of processes and technologies applied in services [2].

These strategies were created based on the understanding that there are flaws in the health care process, but reinforces the need for teamwork in order to be organized in the face of the adverse situation that has occurred, providing the elaboration of new plans, actions to minimize risks, the use of specific protocols that adapt to the reality of the hospital unit, and purposefully increase patient safety [2, 7]. Considering the above, it is essential that the surgical team - surgeons, anesthesiologists, nursing professionals - know and understand the attributions and competencies exercised by each of the members of the multidisciplinary team, as the surgical patient and the scenario of the surgical environment are characterized by vulnerability and the risks inherent to the surgical anesthetic procedure. Responsibility for care based on safe practices reinforces the nuances surrounding the stages of the perioperative period and the needs for assertive care and justifies the relevance of identifying strategies for preventing AEs in the operating room [9,15].

II. METHODS

This is an integrative literature review, carried out in November 2019 from the guiding question "What are the strategies used for the prevention of adverse events in surgical centers?", Formulated through the PICO - Patient, Intervention, Comparison strategy and "Outcomes" (outcome) [16].

The research was carried out in the databases LILACS (Latin American and Caribbean Literature in Health Sciences), MEDLINE (International Literature in Health Sciences), BDENF (Nursing Database) contained in the Virtual Health Library (VHL), Science Direct, PubMed (US National Library of Medicine National Institutes of Health)/MEDLINE. The search for descriptors in Portuguese for the research was carried out with the help of Health Sciences Descriptors (DeCS), and the search for English translations by Medical Subject Headings (MeSH).

The following strategy was used to cross the descriptors: "Medical Errors AND Surgical Centers", "Patient Safety AND Surgical Centers", "Medical Errors AND Surgical centers", "Patient Safety AND Surgical centers". For the selection of articles, the following inclusion criteria were applied: articles derived from original research, published in the last seven years (2013 to 2019), in English, Portuguese, Spanish and German, with full text available and free that answered the proposed objective. Duplicate publications were excluded from the search, which were considered those contained in more than one database and the same publication with different languages, in addition to review articles, chronicles, narratives, letters to the editor, dissertations and theses.

For data analysis, a spreadsheet was created with the aid of Microsoft® Office Excel software, cataloging articles by crossing descriptors, database, author, year, title and language. For the screening and selection of articles, the PRISMA method (Transparent Reporting of Systematic Reviews and Meta-Analyzes) was used, this method is performed in four stages [17].

In the first stage "Identification", an initial analysis was carried out to screen for duplicate articles. Then, in the second stage "Selection", a second screening was made based on the titles and abstracts of all articles. After analyzing the abstracts, in the third stage "Eligibility", the sample was delineated from reading the text in full, excluding those that did not meet the inclusion criteria. In the fourth stage "Inclusion", a total of two articles, were selected, meeting the criteria established as described in Fig.1.

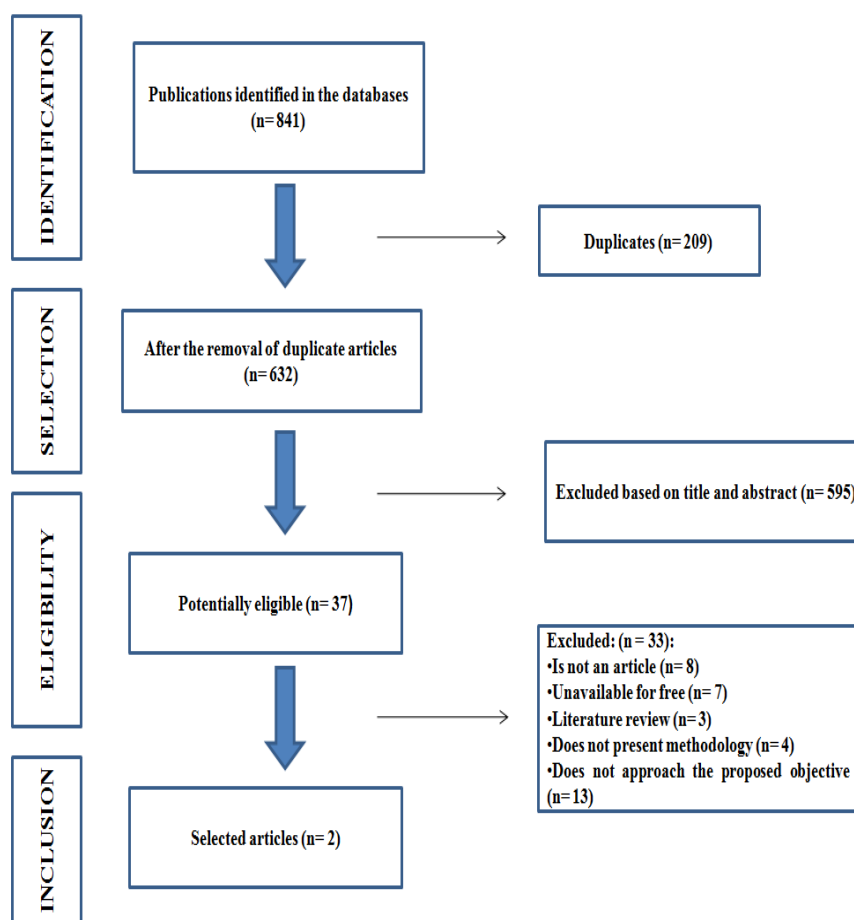


Fig. 1: Flowchart representing the stages of article selection. Recife, Pernambuco (PE), Brazil, 2020. Adapted by PRISMA [17].

Source: Created by the authors.

After the stage of inclusion of the articles, the level of evidence of the selected studies was defined and determined in accordance with the Agency for Healthcare Research and Quality, to assess the quality and strength of the recommendation contained in the articles. This system classifies the quality of the evidence found in V levels in an increasing way, thus, the higher the level, the greater the confidence in the results found [18].

In order to simplify the understanding of the publications selected in this systematic review, the data were organized into figures and tables, presented in a descriptive manner.

III. RESULTS

A total of 841 publications were found in the databases. For the crossing of descriptors: “Medical Errors AND Surgical Centers” 371 publications were identified, “Patient Safety AND Surgical Centers”, 443 publications

were identified, “Medical Errors AND Surgical centers”, five publications were identified, “Patient Safety AND Surgical centers”, 22 publications were found. Regarding the databases, 709 publications were found in MEDLINE, 56 in LILACS, 38 in BDENF, 11 in Science Direct and 27 in PubMed.

During the screening stages, 209 duplicate publications were excluded, leaving 632 publications. After reading the title and abstract, 593 publications were excluded, leaving 37 publications. Of these, eight publications did not fit as articles, seven articles were not available for free, and three articles were literature reviews. Thus, 19 were selected to read the full text in its entirety, of these, four articles did not have a clear methodology, 13 articles did not address the proposed objective. The final sample of this review consisted of two scientific articles, selected by the inclusion criteria previously established.

Both selected studies are international, published in the last five years. Table 1 lists data from articles such as: title,

author and year of publication, place of study, objective of the study, data collection instrument, level of evidence and methods.

Table.1: Data extracted from articles selected for systematic review. Recife, Pernambuco (PE), Brazil, 2020.

Title	Author/Year	Study location	Objective	Type of study	Level of evidence	Material and Methods
When a checklist is not enough: How to improve them and what else is needed	RAMAN et al. / 2016	Chicago	Understand why the time intervals and the verification lists are sometimes not efficient in the prevention of adverse surgical events and identify necessary additional measures to reduce these events.	Retrospective case review	V	From this analysis of incidents with the CAST (casual analysis based on systems theory) categorized recommendations were elaborated using the VA Action Hierarchy tool.
Implementation and evaluation of error prevention measures in surgical clinics: Results of a current online survey	ROTHMUND et al. / 2015	Germany	Evaluate the current status in the use and evaluation of measures to improve patient safety in surgical clinics	Survey type inquiry	V	Application of an online questionnaire with 52 standardized questions about specific measures and instruments for the prevention of surgical errors

Source: Created by the authors.

A total of 3,328 surgeons participated in the German study, who answered an online questionnaire on the current status of use and evaluation of measures for patient safety in surgical clinics [19].

Whereas, the study carried out in Chicago, was made from the analysis of 380 complex cardiac surgeries during 24 months, of which 30 adverse events were identified, and

sought to evaluate the reasons why the checklists are not effective in preventing events thus generating stronger, intermediate or weaker recommendations [20]. These results are shown in table 2.

Table. 2: Results found in the systematic review articles. Recife, Pernambuco (PE), Brazil, 2020.

Strategies for the prevention of adverse events

- Use of lists for perioperative verification;
 - To adapt the verification lists to the necessities of the surgical team;
 - To periodically review the protocols and work processes;
 - To implement weekly meetings between the nursing team and the surgical team to facilitate multiprofessional communication;
 - To standardize the names of the equipment to facilitate communication;
 - To promote systematic training in the introduction of new devices;
 - To elaborate coherent and consistent reports to the incidents with medical devices;
 - To implement international patient safety goals; use of identification bracelets; Preoperative laterality marking;
 - To implement surgical management and planning tools and good practices in the surgical team;
 - To implement an incident report system and a formal program for the analysis of adverse events;
 - Outline the infection statistics of the surgical site;
 - Outline the infection statistics of the surgical site;
 - To stimulate safety culture as a priority of the health system, and co-responsibility of the multiprofessional team.
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Source: Created by the authors.

IV. DISCUSSION

Since 2004, strategies have been created in an attempt to strengthen patient safety, through the implementation of safety lists, standardization of procedures and a growing concern with the safety culture of professionals. However, it is still seen, in analyzes [11,21], that specific problems persist, which highlights the importance of identifying the strategies that are being adopted for the prevention of adverse events in the surgical environment.

AEs in surgical procedures represent the majority of AEs occurring in the hospital environment [22,23]. As one of the useful tools for the prevention of AEs, the use of perioperative checklists is described [19,20]. The literature maintains that surgical checklists, especially the checklist recommended by the World Health Organization, increase the climate of safety [7,24].

However, some issues cannot be resolved just by using the surgical safety list. Limitations such as the lack of communication between members of the surgical team, absence of supplies, incomplete surgical team, with consequent delays in surgical planning, absence of implants and inadequate handling of equipment or instruments, can be minimized with institutional policies that encourage not only the use checklists but periodic updating and review of work protocols and processes, and assessment of professional skills and continuing education needs [20,25].

Preoperative laterality marking is one of the recommended actions in safe surgery and is based on the significant volume of surgeries in the wrong location [19]. Systematic review conducted in 2015 found 28 different rates of occurrence of surgeries performed in the wrong location, with an average estimate of 0.09 adverse events per 10,000 surgeries [25].

This type of event occurs due to gaps in the surgical assistance verification process, which includes prior verification of the surgical procedure, confirmation of the patient and the surgery site; and laterality marking [26].

To reduce the occurrence of these events, the use of the identification bracelet is also suggested as a preventive measure [19]. Data from a survey carried out based on the observation of 30 cardiac surgery procedures, showed that in 90% (n = 27) of the cases the identification was not done correctly, this being a conference indicator that prevents the procedure from being performed on the patient wrong [24].

Among the identified measures, the observance of national guidelines on the notification of AEs and the elaboration of coherent and consistent reports on incidents with medical devices, as well as the incentive to systematic training in the acquisition of new devices, as evidences highlight the frequency of AEs in the surgical environment, such as burns resulting from the improper use of electrocautery and pressure injuries associated with surgical positioning [11,21].

The implementation of weekly meetings between the nursing team and the surgical team to facilitate multi-professional communication is a point discussed in the literature. It corroborates the management actions and mutual cooperation between the members of these teams, and attitudes of co-responsibility and decision-making for patient safety [20,21].

The improvement in communication also has a positive impact on the safety culture, since a survey of 148 health professionals in the surgical center showed that the safety dimensions are low in a hostile environment and unfavorable to communication [27].

The implementation of an incident reporting system and a formal AES analysis program are described as effective measures, as the analysis of the occurrence of these AEs allows the development of prevention strategies [19,20]. However, it is emphasized that these reports should not be implemented with the intention of generating punitive measures, but rather, promoting resolute actions or practical solutions [28,29].

The design of infection statistics [19], is a recommendation supported by the prerogative that surgical site infections represent the main infections related to health care. These statistics can provide information on essential prevention measures for reducing infection rates, such as care for hand hygiene, how to safely administer medicines, how to decontaminate care environments, how good processing practices of health products and the handling of devices in the patient [26].

Conferences on morbidity and mortality rates [19] they are important educational tools to understand the occurrence and aspects of adverse events and assist the team in the search to qualify health care and patient safety. A study that sought to characterize the number of initiatives resulting from these conferences or periodic meetings, monitored and analyzed 59 conferences and identified 282 initiatives or proposals resulting from these meetings, related to multi-professional teams, the creation or modification of checklists or checklists of security, protocols or institutional policies [30].

However, there is still a lack of evidence on the effectiveness of these conferences, in addition to some negative aspects such as their retrospective character, in the form of reports, where important information can be suppressed, and the random frequency of these meetings and the lack of standardization, makes that this measure is not as effective, if not carried out effectively [30,31].

In this context, nurses have an essential role in implementing a culture of safety in the surgical environment, as their leadership role encourages the team

to develop safe attitudes that favor a safe environment, essential for the implementation of improvements [32].

V. CONCLUSION

To reduce the incidence of adverse events in the operating room, it is necessary to identify them, since the perception of failures in the different phases of care, allows the identification of recurrent errors and a critical assessment for decision making, which contributes to the prevention of subsequent errors and more effective interventions.

From this research, it was possible to identify few studies on the subject, although it is so relevant to patient safety. Studies on strategies for preventing adverse events in the surgical environment contribute to the body of knowledge for a public health problem and provide management and the surgical team with a scientific basis for implementing measures such as assertive communication, teamwork and evidence-based practices such as using the surgical safety checklist, demarcating laterality, among other measures.

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