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The role of nurses in the surgical safety checklist: impacts on reducing adverse events

Atuação do enfermeiro no checklist de cirurgia segura: impactos na redução de eventos adversos

Actuación del enfermero en la lista de verificación de cirugía segura: impactos en la reducción de eventos adversos

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Abstract: Patient safety is one of the main components of healthcare quality, especially in the surgical environment, due to the risks associated with procedures and the possibility of adverse events. In this context, the Surgical Safety Checklist (SSC) stands out as a tool designed to identify risks, improve communication among healthcare professionals, and prevent errors during the perioperative period. This study aimed to analyze the nurse's role in implementing the surgical safety checklist and its contribution to reducing adverse events. This is an integrative literature review with a qualitative approach and descriptive nature, conducted using the LILACS, SciELO, and MEDLINE/PubMed databases, considering articles published between 2021 and 2026 in Portuguese, English, and Spanish. The results showed that nurses play an important role in organizing care, supervising the checklist stages, facilitating communication among professionals, promoting continuing education, and monitoring safety practices. However, barriers were identified, including incomplete team adherence, communication failures, insufficient training, resistance to change, and the use of the checklist merely as a documentation tool. It is concluded that the checklist has the potential to strengthen patient safety and prevent surgical risks, although its effectiveness depends on multidisciplinary participation, institutional support, and continuous training. Therefore, the nurse's role contributes to the implementation of safe practices and the improvement of surgical care quality.

Keywords: Patient safety. Safe surgery. Checklist. Nursing. Adverse events.

Resumo: A segurança do paciente constitui um dos principais componentes da qualidade da assistência à saúde, especialmente no ambiente cirúrgico, em razão dos riscos associados aos procedimentos e à possibilidade de ocorrência de eventos adversos. Nesse contexto, a Lista de Verificação de Segurança Cirúrgica (LVSC) destaca-se como uma ferramenta destinada à identificação de riscos, à melhoria da comunicação entre os profissionais e à prevenção de falhas durante o período perioperatório. O presente estudo teve como objetivo analisar a atuação do enfermeiro na aplicação do checklist de cirurgia segura e sua contribuição para a redução de eventos adversos. Trata-se de uma revisão integrativa da literatura, de abordagem qualitativa e caráter descritivo, realizada nas bases de dados LILACS, SciELO e MEDLINE/PubMed, considerando artigos publicados entre 2021 e 2026, nos idiomas português, inglês e espanhol. Os resultados evidenciaram que o enfermeiro desempenha papel relevante na organização da assistência, na supervisão das etapas do checklist, na comunicação entre os profissionais, na educação permanente e no acompanhamento das práticas de segurança. Entretanto, foram identificadas barreiras relacionadas à adesão incompleta da equipe, às falhas de comunicação, à insuficiência de treinamento, à resistência às mudanças e ao preenchimento meramente documental do instrumento. Conclui-se que o checklist apresenta potencial para fortalecer a segurança do paciente e prevenir riscos cirúrgicos, embora sua efetividade dependa da participação multiprofissional, do apoio institucional e da capacitação contínua. Assim, a atuação do enfermeiro contribui para a incorporação de práticas seguras e para a melhoria da qualidade da assistência cirúrgica.

Palavras-chave: Segurança do paciente; Cirurgia segura; Lista de verificação; Enfermagem; Eventos adversos.

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Resumen: La seguridad del paciente constituye un componente principal de la calidad de la atención médica, especialmente en el entorno quirúrgico, debido a los riesgos asociados a los procedimientos y a la posibilidad de que ocurran eventos adversos. En este contexto, la Lista de Verificación de Seguridad quirúrgica (LVSC) destaca como una herramienta destinada a identificar riesgos, mejorar la comunicación entre los profesionales y prevenir fallas durante el período perioperatorio. El presente estudio tuvo como objetivo analizar el desempeño del enfermero en la aplicación de la lista de cirugía segura y su contribución a la reducción de eventos adversos. Se trata de una revisión integradora de la literatura, de carácter cualitativo y descriptivo, realizada en las bases de datos LILACS, SciELO y MEDLINE/PubMed, considerando artículos publicados entre 2021 y 2026, en portugués, inglés y español. Los resultados mostraron que el enfermero desempeña un papel importante en la organización de la asistencia, en la supervisión de las etapas de la lista de verificación, en la comunicación entre los profesionales, en la educación permanente y en el seguimiento de las prácticas de seguridad. Sin embargo, se han identificado barreras relacionadas con la adhesión incompleta del equipo, los fallos de comunicación, la falta de capacitación, la resistencia al cambio y el llenado meramente documental del instrumento. Se concluye que la lista tiene potencial para fortalecer la seguridad del paciente y prevenir riesgos quirúrgicos, aunque su efectividad depende de la participación multiprofesional, el apoyo institucional y la capacitación continua. Así, la actuación del enfermero contribuye a incorporar prácticas seguras y a mejorar la calidad de la asistencia quirúrgica.

Palabras clave: Seguridad del paciente; Cirugía segura; Lista de verificación; Enfermería; Eventos adversos.

1. Introduction

Patient safety is a key component of the quality of healthcare, especially in the face of the possibility of care-related damage. According to the World Health Organization (WHO), patient safety is related to preventing preventable harm and reducing unnecessary risks associated with health care (ORGANIZAÇÃO MUNDIAL DA SAÚDE, 2024).

In Brazil, this theme was reinforced with the creation of the National Patient Safety Programme (PNSP), instituted by Portaria no. 529 of 1 April 2013, which defines patient safety as – reducing to an acceptable minimum the risk of unnecessary harm associated with healthcare – (BRASIL, 2013).

In a hospital context, the surgical centre has characteristics that require special attention to safety practices due to the complexity of procedures, the use of specific medicines and equipment and the simultaneous operation of different professionals. In this scenario, failure to communicate, identify, administer medicinal products and carry out procedures may contribute to adverse events.

Faced with this problem, the World Health Organization launched in 2008 the second Global Patient Safety Challenge, called – Safe Surgeries Save Lives –, which resulted in the Surgical Safety Checklist (ORGANIZAÇÃO MUNDIAL DA SAÚDE, 2009).

The Surgical Safety Checklist consists of 19 items and is organized into three stages: before the anesthetic induction (Sign In), before the surgical incision (Time Out) and before the patient leaves the operating room (Sign Out). The aim of the tool is to facilitate the identification of risks, standardise essential steps of the procedure and improve

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communication between surgical staff (ORGANIZAÇÃO MUNDIAL DA SAÚDE, 2009). Multicentric study by Haynes et al. (2009) It demonstrated that the implementation of the checklist was associated with reduced complications and mortality among patients undergoing surgical procedures.

In this process, the nurse plays a relevant role, taking into account her duties related to the organisation of care, communication between staff and monitoring of safety protocols in the surgical centre. Although the implementation of the checklist is a multi-professional responsibility, the nurse can contribute to its proper implementation by encouraging the participation of the staff and verifying compliance with the steps envisaged. According to Toasts and Galvan (2019), the effective implementation of the list depends on factors such as leadership, responsibility definition, team collaboration and institutional support.

Despite the benefits associated with the use of the checklist, its implementation may encounter difficulties in the practice of assistance, such as resistance from professionals, communication failures, lack of training, overwork and inadequate use of the tool. In this way, incomplete or merely bureaucratic completion of the checklist may compromise its potential for risk identification and prevention (TOSTES; GALVÃO, 2019).

In this context, it becomes relevant to understand the role of the nurse in implementing the Surgical Safety Checklist and its contribution to patient safety. Thus, this study presents as a guiding question: how does the nurse's performance in applying the safe surgery checklist contribute to the reduction of adverse events and to strengthening patient safety in the surgical environment?

The overall objective of this study is to analyse the performance of nurses in applying safe surgery checklists and their contribution to reducing adverse events in surgical patients. As specific objectives, it seeks to identify the main tasks of the nurse in applying the checklist; describe the benefits of the tool for patient safety; identify the main barriers related to its implementation; and analyze its contribution to team communication and prevention of adverse events in the perioperative period.

2. Theoretical framework

2.1 Patient safety and quality of healthcare

Patient safety is a key element in the quality of healthcare, as it is directly related to the prevention of damage from care. The World Health Organization (WHO) considers patient safety a global priority and stresses that preventable risks and adverse events still pose a major problem in different health systems. In this regard, the Global Patient Safety Action Plan 2021 – 2030 sets out strategies to reduce preventable harm and strengthen health systems capable of providing safer care (WORLD HEALTH ORGANIZATION, 2024).

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The magnitude of this problem can be seen in the Global Patient Safety Report 2024, published by WHO, which points out that approximately one in ten patients suffer some damage during health care, and more than half of this damage can be prevented. The report stresses that patient safety depends not only on individual action by healthcare professionals but also on systematic changes in health processes and organisations (WORLD HEALTH ORGANIZATION, 2024).

In the Brazilian context, patient safety is related to the organisation of services, risk management, communication between professionals and the adoption of practices capable of preventing incidents. The Ministry of Health stresses that the National Patient Safety Programme (PNSP) seeks to promote safer practices and reduce the occurrence of adverse events in health services. Its guidelines include promoting a culture of safety, systematic risk management, incident reporting and analysis, patient and family participation and training of professionals (BRASIL, 2021).

In this context, the safety culture is of significant importance as it involves organizational values, behaviours and practices aimed at harm prevention and continuous improvement of assistance. Recent studies show that factors such as teamwork, organizational learning, communication and leadership are linked to strengthening the safety culture in health services. In a systematic review carried out in Latin America, Carvalho et al. (2010) They identified teamwork and organisational learning as the most positive aspects of the safety culture, while aspects related to non-punitive response to errors and staff sizing showed less favourable results.

In addition, professional training is an important strategy for strengthening patient safety. In a systematic review and meta-analysis, Agbar et al. (2023) found that educational interventions related to patient safety can improve safety culture among healthcare professionals. Thus, quality of care is associated not only with the availability of protocols and technologies, but also with professional preparation, effective communication, teamwork, and an organizational culture focused on identifying and preventing risks (AGBAR et al., 2023).

Patient safety should therefore be understood as a shared responsibility between healthcare professionals and institutions, requiring systematic risk identification, assessment and mitigation actions. In this context, security protocols and tools become important instruments for organising assistance processes and reducing the likelihood of adverse events. This perspective is particularly relevant in the surgical environment, characterised by the complexity of procedures and the need for integration between different professionals, which will be further explored in the following topics.

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2.2 Patient safety in the surgical setting

The surgical centre is considered to be a highly complex environment, characterised by the performance of invasive procedures, the use of specific medicines and equipment and the joint action of different professionals. These characteristics make it necessary to adopt systematic strategies for risk prevention and patient safety promotion. Costa et al. (2021) stress that the surgical environment involves complex tasks and requires ongoing attention from the staff and the organisation of supporting materials, equipment and processes is necessary to ensure adequate conditions for carrying out the procedure.

Among the main safety-related factors in the surgical environment are the correct identification of the patient, confirmation of the surgical procedure and site, availability and operation of equipment, control of materials, prevention of infections and communication between professionals. In this sense, surgical safety depends not only on individual technical competence but also on the organisation of work and team integration. Rocha et al. (2021), while analysing the safety culture in Brazilian surgical centres from a nursing perspective, they identified differences between the institutions assessed and highlighted the importance of organisational learning and event reporting for strengthening safety.

Communication between professionals is an essential aspect of preventing incidents during the surgical procedure. Information related to patient identification, procedure, clinical conditions and potential risks needs to be shared clearly and in a timely manner. In this context, Rocha et al. (2021) emphasises that a safety culture must involve values, attitudes and behaviours aimed at preventing harm, and that the fragile dimensions of institutions need to be improved in order to achieve safer assistance.

In Brazil, the implementation of the Surgical Safety Checklist is progressing, but there are still difficulties related to adherence and completion of its stages. Poveda et al. (2021), in a study with nurses from different Brazilian regions, they found that 84.27% of participants reported implementing the checklist in their workplaces.

However, fragility was observed in the execution of important steps: at the Time Out stage, 51.36% reported that surgeries were initiated in some situations without confirmation of one of the items foreseen, while at the Sign Out stage 69.34% reported that surgical instrument and needle counts were not performed or occurred only occasionally. These results show that the existence of the checklist does not ensure its proper application in isolation.

The relationship between the use of the checklist and the occurrence of adverse events was also investigated in a national study by Faria et al. (2022). The authors analysed 851 patients undergoing surgical procedures and observed a reduction in the estimate of adverse events from 13.6% before use of the checklist to 11.8% after implementation. However, this difference was not statistically significant. On the other hand, a significant reduction in the occurrence of deaths was observed among the patients in whom the checklist was used. The

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results indicate that the presence of the instrument alone does not guarantee the reduction of adverse events and it is necessary to integrate it with other safety and quality assistance strategies.

Thus, patient safety in the surgical environment depends on a set of measures involving service organisation, effective communication, teamwork, risk identification and proper use of protocols. The checklist is presented as one of these strategies, but its effectiveness is related to how it is incorporated into the routine of professionals. Nursing involvement thus becomes relevant to facilitate the proper application of safety measures and contribute to the prevention of incidents and adverse events during surgical care.

2.3 Surgical Safety Checklist

The Surgical Safety Checklist, also known as the Safe Surgery Checklist, is a tool used to organize and standardize safety measures during surgical procedures. Its use seeks to reduce flaws in patient identification, the procedure and the surgical site, as well as to promote communication between practitioners and the verification on essential aspects before, during and after surgery. In Brazil, its use is included in the Protocol on Safe Surgery established under national patient safety measures.

The checklist should not be understood merely as a form for recording information but as a communication and collective verification instrument. Cabral et al. (2021) stress that the list should involve the entire surgical team and be used as a strategy to strengthen the safety culture, rather than replacing other actions necessary for the quality of care. Thus, its proper application depends on the participation of professionals and the incorporation of verification into the routine of the surgical centre.

According to the Safe Surgery Protocol of the Ministry of Health, the checklist is divided into three main moments: before anesthetic induction, before surgical incision and before the patient leaves the operating room. These times correspond respectively to the stages called Sign In, Time Out and Sign Out, allowing fundamental information and conditions to be provided in a systematic manner before proceeding.

The first stage, called Sign In, occurs before anesthetic induction. At that time, checks are carried out relating to the patient's identification, the procedure to be performed, the surgical site and consent. Aspects related to anaesthetic safety and possible patient-specific risks are also assessed. The purpose of this step is to prevent the procedure from being initiated in the face of incorrect or incomplete information that could jeopardise patient safety.

The second stage corresponds to Time Out, performed immediately before the surgical incision. This is a break for the confirmation by the team of the patient's identity, procedure and surgical site, as well as the presentation of staff members and discussion of aspects considered relevant to the procedure. This pause promotes communication between

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professionals and allows any discrepancies to be identified and resolved before the incision is made. The Ministry of Health stipulates that the surgical team must participate in this step as part of the safety process.

The third stage, called Sign Out, occurs before the patient leaves the operating room. At this stage, aspects relating to the procedure carried out, the counting of instruments, surgical sponges and needles, the identification of surgical samples and concerns related to recovery and postoperative care are given. In this way, the step contributes to the safe continuity of care and to the identification of possible interconnections before the patient is transferred to another sector.

Although the checklist consists of pre-established steps, its use must take into account the reality and characteristics of each institution. The Safe Surgery Protocol directs services to adapt their application to local conditions while preserving the fundamental principles of safety. Thus, the instrument can be incorporated into institutional processes without losing its purpose of promoting systematic checks and communication among professionals.

In the Brazilian context, Poveda et al. (2021) They identified that the implementation of the checklist was present in a large part of the services assessed, but weaknesses were noted in the implementation of certain steps. The authors verified, for example, that part of the practitioners reported initiating surgeries without confirmation of all items provided for in Time Out and difficulties in properly performing Sign Out. These findings show that the existence of the checklist does not necessarily mean that all its steps are being executed in a complete and systematic manner.

In this sense, the effectiveness of the Surgical Safety Checklist is related to how it is incorporated into professional practice. The mechanical use of the instrument, without discussion of the items and without effective participation of the staff, may limit its benefits. On the other hand, when used as a communication, verification and shared decision-making tool, the list can contribute to early identification of risks and to strengthening safety practices in the surgical environment. Therefore, the checklist should be understood as a tool integrated into the team's work process, and not just as a documentary requirement.

2.4 The role of nurses in applying the surgical safety checklist

The surgical centre nurse shall have a relevant role in the organisation of care and management processes related to patient safety. Being directly involved in the perioperative dynamics, this practitioner participates in assistance planning, operating room organisation, material and equipment management, nursing team supervision and risk prevention measures.

A scope review carried out in the Brazilian scenario identified the implementation of surgical safety measures among the main care activities carried out by surgical centre nurses,

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highlighting their strategic position in promoting the safety and quality of perioperative processes (SILVA et al., 2023).

In the context of the safe surgery checklist, the nurse's role involves organising and monitoring the implementation of the steps envisaged, helping to ensure that the necessary information is verified before, during and after the procedure. However, the use of the list should not be considered to be the sole responsibility of the nurse, since the instrument was developed to promote the participation of the surgical team as a whole. Cabral et al. (2021) stress that the list should involve the entire surgical team and be used as a strategy to strengthen the safety culture, together with the education and training of professionals.

At the Sign In stage, held before anesthetic induction, the nurse can participate in the patient identification verification, procedure and surgical site, as well as verify information relevant to anesthetic-surgical safety. That verification shall contribute to identifying possible inconsistencies before the procedure is initiated. The professional's performance at this time is related not only to the completion of the instrument but also to the effective confirmation of information with the other members of the team.

During the Time Out, held immediately before the surgical incision, the nurse's participation is related to organizing the safety pause and confirming the items provided for in the protocol. At that time, communication between practitioners should allow confirmation of the identity of the patient, the procedure, the surgical site and aspects relevant to the operation. The active participation of the team is essential, as the purpose of the break is not only to record responses but to enable divergent information to be identified and resolved before the procedure continues.

During Sign Out, nurses can also help verify items related to completion of surgery. These include confirming the procedure performed, counting instruments, needles, surgical sponges and gauze, identifying specimens for histopathological analysis, and communicating concerns about patient recovery. When investigating checklist implementation among nursing professionals in Brazil, Poveda et al. (2021) identified weaknesses precisely in the execution of some of these items, showing that the formal presence of the instrument does not, by itself, guarantee that all checks are adequately completed.

In addition to the direct application of the checklist, the nurse has an important role related to the continuing education of the staff. The training of practitioners makes it possible to clarify the purpose of each item, guide how the checks are to be held and encourage the participation of the different members of the surgical team. In the review by Silva et al. (2023) In addition, the continuing education of nursing staff has been identified as one of the activities carried out by surgical centre nurses, reinforcing the importance of this professional in the qualification processes of nursing.

A further relevant assignment relates to monitoring accession to the Protocol. The nurse can contribute to identifying failures in the application of the checklist, registering

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non-compliances, monitoring indicators and discussing the results with the staff and management. This makes it possible to recognise existing difficulties in the work process and to establish improvement strategies. Cabral et al. (2021) have demonstrated, in a study conducted at a Brazilian surgical centre, that the use of auditing and educational activities can be used to identify vulnerabilities and promote improvements in adherence to checklist-related good practices.

The nursing profession also involves the interaction between different professionals and sectors. The surgical centre has a complex dynamic in which the availability of materials, equipment, professionals and information must be organised in order for the procedure to take place safely. In this respect, Silva et al. (2023) They identified the management of materials, supplies and equipment and the preparation of surgical rooms among the frequent activities of surgical centre nurses. These actions are directly related to security, as inadequate structural and organisational conditions may make it difficult to implement the measures provided for in the Protocol.

Despite the importance of nursing in this process, effective checklist implementation may be hindered by factors related to work organization and professional adherence. Difficulties identified in Brazilian literature include resistance to change, failures in team organization, insufficient understanding of the instrument's purpose, and inappropriate checklist use. Poveda et al. (2021) found differences in completion of checklist stages among the professionals evaluated, while Silva et al. (2023) highlighted the need for training, feedback on results, and integration of the instrument into existing practices.

In this way, the nurse's role in applying the safe surgical checklist goes beyond simply filling out a form. It involves organising, supervising, communicating, continuing education, monitoring and joining the team so that safety measures are effectively incorporated into the work process. However, in order for the checklist to achieve its purpose, it is necessary that these actions are developed in a multi-professional and integrated manner, considering the instrument as a means of communication and risk prevention. Thus, the involvement of the nurse is an important component for the implementation and maintenance of safety practices in the surgical environment, contributing to early risk identification and the qualification of perioperative care.

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2.5 Barriers and challenges in checklist implementation

While the Surgical Safety Checklist is a relatively simple and low-cost application tool, its effective implementation in the surgical environment presents different challenges. The appropriate use of the checklist depends on factors related to institutional organisation, work process and participation of professionals. In this way, the mere availability of the instrument does not guarantee its proper use and it is necessary to incorporate it into the routine of the staff and the set of strategies aimed at promoting patient safety.

Among the main barriers is the low adherence of professionals to the proposed stages. Poveda et al. (2021), in a study of 531 Brazilian nurses, identified that although 84.27% of participants reported the implementation of the checklist in their workplaces, there were still significant flaws in the implementation of the steps. In the Time Out phase, for example, 51.36% reported that surgeries were initiated regardless of confirmation of one of the planned items. At Sign Out, 69.34% reported that surgical instruments and needles were not counted or only occasionally counted. These results demonstrate the difference between the formal implementation of the instrument and its effective use in practice.

Another challenge relates to the resistance of professionals to changes in the work process. The implementation of a checklist modifies certain routines in the surgical centre and requires professionals to temporarily stop their activities for collective checks. In this context, resistance may occur when the team does not understand the purpose of the instrument or when its use is perceived only as an administrative requirement. Brazilian studies point out that unplanned implementation and a change-resistant institutional culture can make it difficult to incorporate the list into everyday practice.

The absence or insufficient training is also an important barrier. In order for the checklist to be used appropriately, professionals need to understand not only which items must be checked, but also the purpose of each check and the importance of collective participation. Cabral et al. (2021) have identified that staff education and training are important criteria for the implementation of checklist-related best practices. In the study, educational activities were carried out from the barriers identified in the audit, resulting in increased conformity across different criteria assessed.

Communication and teamwork are other key elements. The checklist has been developed to facilitate communication between practitioners and allow relevant information to be shared before critical moments of the procedure. However, when team members do not actively participate in the safety pause, the list may lose some of its purpose. In this sense, the implementation of the checklist requires collaboration between the different professionals involved in surgical care, with clearly established responsibilities and multi-professional participation.

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Lack of institutional support and leadership can also jeopardise the continued use of the instrument. The implementation of a safety practice depends on organisational conditions that favour its maintenance, including the definition of responsibilities, monitoring of results, training of professionals and availability of resources. an integrative review of the implementation process of the checklist identified that effective leadership, collaboration among team members and institutional support are necessary elements to overcome the difficulties encountered during its implementation.

Another relevant aspect is the possibility of merely formally completing the checklist. In this situation, the items may be marked without any actual verification or discussion between the professionals. This practice reduces the instrument's potential as a safety barrier by making a tool for reporting and identifying risks a predominantly documentary procedure. Cabral et al. (2021) emphasise that the checklist should involve the entire surgical team and be used to promote patient safety and not replace other initiatives aimed at developing a safety culture.

The overwork and dynamics of the surgical centre can also make it difficult to properly apply the list. The industry routine involves procedures with varying levels of complexity, the need to organize materials and equipment, simultaneous work by various professionals and time-related pressure. In this context, when the team considers the checklist as an additional step that prolongs the procedure, accelerated or incomplete completion of its steps may occur. Therefore, its implementation should be integrated into the workflow, avoiding it being perceived as an activity disconnected from assistance.

Another challenge is to maintain membership over time. Even after initial deployment, the use of the checklist may be reduced when there are no mechanisms for monitoring, auditing and returning results to the team. The experiment described by Cabral et al. (2021) demonstrates that the audit associated with educational activities can contribute to improving compliance with certain criteria, although not all indicators have achieved high levels of compliance. This shows that improving the use of the checklist is an ongoing process, which requires ongoing monitoring and education.

In addition, the adequacy of the instrument to the institutional reality is an aspect to be considered. An overly extensive, unobjective or not integrated checklist into existing processes may make it difficult to use. Costa et al. (2021), by developing and validating a checklist for the organisation of operating rooms, demonstrated the importance of building and validating instruments that take into account the specific needs of the service and provide consistency for its use by the staff.

In the face of these barriers, the implementation of the checklist should be understood as a process of organisational change and not merely the introduction of a new form. It is necessary to promote training, establish responsibilities, encourage multi-professional participation, strengthen communication and monitor team membership on an ongoing basis.

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In this process, the nurse can play a relevant role in organising activities, continuing education and monitoring safety practices without depriving other professionals of shared responsibility for the proper use of the instrument.

Therefore, the challenges related to the implementation of the checklist are directly linked to how the tool is incorporated into the institution's culture and work process. Overcoming barriers depends on strategies that foster professional involvement, management support, ongoing training and the use of the checklist as a means of risk communication and prevention. In this way, its effectiveness should be assessed not only by the existence or completion of the list but also by the quality of team participation and the integration of checks into the surgical patient's care.

3. Methodology

This study is an integrative review of the literature, qualitative and descriptive in nature, designed to gather, analyse and synthesize scientific knowledge related to the performance of nurses in the application of the Surgical Safety Checklist (SSC) and their contribution to surgical patient safety. Integrative review is a method that allows for the collection of results from different types of studies, providing a broader understanding of a particular subject and identifying evidence, gaps and contributions of scientific knowledge to professional practice (SOUZA; SILVA; CARVALHO, 2010). The method also makes it possible to integrate studies with different methodological approaches, enabling a more comprehensive analysis of the phenomenon under investigation (WHITTEMORE; KNAFL, 2005).

In order to guide the bibliographic search and analysis of studies, a guiding question was established: – How does the nurse's performance in applying the Surgical Safety Checklist contribute to strengthening safety culture and minimizing harm to the surgical patient? – The guiding question guided the definition of descriptors, the searching of databases, the selection of studies and the organisation of results.

The development of the integrated review was based on the methodological steps proposed by Whittemore and Knafl (2005) and described also by Souza, Silva and Carvalho (2010), comprising the definition of the research question, the search in the literature, the selection of studies, the collection and organisation of data, the analysis of the information found and the synthesis of the results. In this way, the review process was carried out in a systematic manner, with a view to ensuring greater organisation and consistency in the identification and analysis of publications related to the subject.

The bibliographic search was carried out in the Latin American and Caribbean Literature in Health Sciences (LILACS), Scientific Electronic Library Online (SciELO) and Medical Literature Analysis and Retrieval System Online (MEDLINE/PubMed) databases,

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considering their relevance to scientific production in the areas of health and nursing. For the identification of the studies, descriptors related to patient safety, safe surgery, surgical safety checklist, checklist and nursing were used, combined by BOolean AND and OR operators according to the characteristics of each database.

Full scientific papers, published between 2021 and 2026 in the Portuguese, English or Spanish languages, which were directly related to the subject under investigation were included, in particular studies on the use of safe surgery checklists, the nursing practice in the surgical environment, patient safety or prevention of adverse events related to surgical procedures. Duplicate articles from the databases consulted, publications not directly related to the guiding question, incomplete studies, editorials, letters to the editor, summaries of scientific events and academic papers which did not correspond to the format of a scientific article, such as dissertations, theses and coursework, were excluded.

The selection of studies was initially carried out by analysing the titles and summaries of the publications identified. Subsequently, the articles deemed to be potentially relevant were read in their entirety to verify their suitability for the criteria of inclusion and exclusion previously established. Following final selection, information on the author, year of publication, title, objective, methodology, population or sample, main results and conclusions of studies were extracted. The data were organised in a systematic manner, allowing comparison between the different publications and identification of converging and diverging aspects related to the performance of the nurse and the use of the safe surgery checklist.

The analysis of the results was carried out in a qualitative and descriptive manner, seeking to identify the main evidence related to the performance of the nurse in applying the Surgical Safety Checklist as well as the barriers and challenges encountered for its implementation and the possible contributions of the instrument to the prevention of incidents and adverse events in the surgical environment. The findings were subsequently synthesized and presented in a descriptive manner, enabling an integrated understanding of scientific production on the subject.

Since it is an integrated review of the literature, based solely on information from previously published scientific studies and available in selected databases, there has been no direct contact with humans or primary data collection. In this way, the principles of academic integrity and ethics in the use of information were observed, with due identification and reference to the authors and sources used, while respecting the copyright of the publications examined.

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4. Results and discussion

The analysis of the selected literature allowed to identify different aspects related to the performance of the nurse in the application of the Surgical Safety Checklist (SLS), highlighting its importance for the organisation of the perioperative process, communication between professionals and risk prevention to the patient. The studies analysed have also shown that the effectiveness of the checklist is not solely dependent on its availability or completion but is related to team membership, professional training, institutional support and incorporation of the tool into the surgical centre routine.

The findings were organized into four main aspects: implementation and adherence to the safe surgery checklist; nurse performance in the surgical safety process; barriers and challenges to its use; and relationship between the checklist and the occurrence of adverse events. The analysis of these aspects makes it possible to understand both the contributions of the tool and the limitations found in its application in assistance practice.

4.1 Implementation and adherence to the surgical safety checklist

The studies analysed showed that the Surgical Safety Checklist is deployed in a significant proportion of the services evaluated in Brazil, but its application still presents significant differences between the stages of the instrument. Poveda et al. (2021) In a cross-sectional study of 531 nurses, they identified that 84.27% of participants reported implementing the checklist in their workplaces. However, the results showed that the existence of the instrument did not necessarily mean its complete and systematic implementation.

In the Sign In stage, performed prior to anesthetic induction, 79.65% of the participating practitioners reported confirmation of patient identification by two indicators. While this result demonstrates an explicit adherence to an essential safety measure, it also shows that a proportion of professionals did not conduct the verification properly. In the Time Out stage, the results were even more troubling, as 51.36% of participants reported that surgeries were initiated regardless of confirmation of one of the planned items. At Sign Out, only 30.66% reported continuously counting surgical instruments and needles, while 39.54% did so occasionally and 29.80% did not.

These results show that one of the main challenges related to the checklist is not necessarily its implementation but its effective adherence to its stages. The difference between owning the instrument and using it appropriately is relevant to patient safety as the checklist has been developed to function as a barrier against foreseeable risks. Where items are filled in incompletely or only formally, part of their preventive purpose may be compromised.

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Cabral et al. (2021) They reinforce this understanding by pointing out that the checklist should involve the entire surgical staff and be associated with the education and training of professionals. The authors also point out that the checklist should contribute to strengthening the security culture and should not be used as a substitute for other institutional actions aimed at the quality of care.

Thus, the findings indicate that the effectiveness of the checklist is directly related to the quality of its implementation. The use of the tool needs to be linked to communication between professionals and the actual verification of information, not just the filling in of the document. This perspective is particularly important for the nursing practice, given its role in organising the surgical centre's care processes.

4.2 The role of nurses in checklist application

The literature analysed shows that the nurse has an important role in organising safety practices in the surgical centre. Trevilato et al. (2023), in a scoping review on the activities of surgical centre nurses in the Brazilian scenario, they analysed 18 studies and identified that the implementation of surgical safety-related measures was among the main care activities described in the literature. The study pointed to this activity in 50% of the work analysed. Activities related to the management of materials, inputs and equipment, room preparation, staff supervision, nursing records, implementation of support protocols and continuing education were also identified.

These findings make it clear that the nurse's participation in the checklist is part of a broader set of responsibilities related to the care and management of the surgical centre. The professional is not only involved in completing the list, but also in organising the conditions necessary for safety measures to be implemented.

The nurse's performance may occur at different times on the list. At Sign In, their participation is related to the patient identification verification, procedure, surgical site and other relevant information prior to anesthetic induction. In Time Out, the practitioner can contribute to carrying out the safety pause and collective confirmation of information before incision. At Sign Out, he participates in the verification of items related to the closure of the procedure, including counts, identification of materials and communication of information relevant for the continuation of assistance.

The performance of the nurse is also related to the continuing education of the staff. Trevilato et al. (2023) They identified continuing education as a teaching activity present in 50% of the studies analysed, demonstrating that the nurse is also involved in the training and updating of the nursing staff.

This function is important for the implementation of the checklist, as the team needs to understand the purpose of each step and not just know the items to be marked. Training can

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help turn the checklist from a predominantly documentary activity into a practice of risk reporting and identification.

However, it is important to note that the nurse is not solely responsible for applying the checklist. It is a multi-professional tool, the effectiveness of which depends on the participation of the different professionals involved in the procedure. Thus, nursing plays an important role in organizing and monitoring the practice, but the expected results depend on the collective commitment of the surgical team.

4.3 Barriers and challenges in checklist use

The studies analysed also revealed different barriers to the proper use of the checklist. The main challenges identified include incomplete staging, communication failures, the need for training, resistance to changing routines and predominantly documentary use of the instrument.

The results found by Poveda et al. (2021) They clearly demonstrate this difficulty. Although 84.27% of practitioners reported the implementation of the checklist, significant vulnerabilities were identified at different times of application. In the Time Out stage, more than half of the participants reported situations where surgeries were initiated without confirmation of one of the planned items. In the Sign Out, limitations were also observed in performing instrument and needle counting and in discussing concerns related to patient recovery.

This data suggests that the formal implementation of a protocol is not sufficient to produce sustainable changes in practice. It is necessary for professionals to recognise the checklist as a security and communication tool. Where the instrument is perceived only as an administrative requirement, there is a risk that it will be filled in mechanically without the information being effectively discussed by the team.

Cabral et al. (2021) highlight the importance of team participation, education and training for the proper use of the checklist. The study also points out that the list should be integrated into an institutional security culture and not considered as an isolated action.

In this context, management support and leadership become important for maintaining practice. Monitoring indicators, carrying out audits, providing training and returning results to professionals can help identify difficulties and stimulate continuous improvement.

Thus, overcoming barriers requires an institutional approach. It is not enough to hold the professional individually responsible for completing the list, as membership relates to working conditions, organisation of service, communication between professionals and the security culture in the institution.

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4.4 The checklist and reduction of adverse events

The relationship between the use of the checklist and the reduction of adverse events is one of the main points of interest in this review. The findings indicate that the tool has potential to contribute to patient safety, but its effects on adverse events may vary according to the form and context of its implementation.

Faria et al. (2022), in a national study involving 851 patients undergoing surgical procedures, compared periods before and after the implementation of the checklist. The authors observed a reduction in the adverse event estimate from 13.6% to 11.8% following the use of the instrument. However, this difference was not statistically significant (p=0,213). The study also identified a significant reduction in the occurrence of deaths among the patients in whom the checklist was used.

This result is relevant because it demonstrates that the presence of the checklist should not be automatically interpreted as a guarantee of reduction of adverse events. The tool can contribute to risk prevention, but its effectiveness depends on a number of factors related to the implementation, adherence and quality of communication established during its application.

The absence of a statistically significant difference in the overall incidence of adverse events also demonstrates the need to interpret the results with caution. Surgical safety is influenced by multiple factors, including patient clinical conditions, complexity of the procedure, available structure, service organization, team experience and communication among professionals. Therefore, it would not be appropriate to attribute any change in the occurrence of adverse events exclusively to the checklist.

On the other hand, the findings reinforce the instrument's potential as a safety barrier. By organising checks before critical points in the procedure, the checklist creates opportunities for identifying incorrect information, communication errors and risks that could go unnoticed. Its benefit is therefore related not only to the direct reduction of events, but also to the prevention and early identification of conditions which may favour their occurrence.

4.5 Synthesis of findings

The joint analysis of the studies shows that the role of the nurse is related to different dimensions of surgical safety, including environmental organisation, implementation of safety measures, application of protocols, communication, records, supervision and continuing education. The Brazilian literature identifies surgical safety as a relevant activity of the surgical center nurse, included in a set of assisting and managerial tasks.

However, studies also show that there are differences between the formal implementation of the checklist and its effective use. The presence of the instrument in service

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does not guarantee that all steps are carried out properly. The weaknesses observed mainly in the Time Out and Sign Out stages highlight the need to strengthen team participation and communication during the process.

For adverse events, the findings indicate that the checklist may be associated with improvements in certain safety outcomes, but should not be considered an isolated intervention capable of eliminating surgical risks. The national study by Faria et al. (2022) For example, it found a reduction in the estimate of adverse events after its deployment, but without statistical significance, while identifying a significant reduction in deaths among patients in whom the checklist was used.

The results thus support the understanding that the nurse's contribution to surgical safety occurs mainly through the organisation, coordination, communication, education and monitoring of safety practices within a multi-professional operation. The checklist is an important tool in this process, but its results depend on how it is incorporated into institutional routine.

Thus, the literature analysed makes it possible to understand that effective use of the Surgical Safety Checklist is associated with the existence of a safety culture, training of professionals, multi-professional participation and continuous monitoring of membership. In this context, the nurse plays a strategic role in the operationalization of these practices, helping to ensure that the checklist is used not only as a recording tool but also as a mechanism for reporting and identifying risks during perioperative care.

5. Final considerations

Patient safety in the surgical environment is directly related to the adoption of practices capable of reducing risks, preventing failures and promoting organized and integrated care. In this context, the Surgical Safety Checklist stands out as a tool that contributes to standardisation of care, communication between practitioners and identification of possible risks at different points in the surgical procedure.

The findings discussed during this study showed that the nurse has a relevant role to play in the use of the checklist, especially through her role in the organisation of the surgical centre, monitoring safety steps, communication with staff, process supervision and development of continuing education actions. These tasks enable the instrument to be incorporated into the care routine more systematically and contribute to strengthening safety practices.

However, it was also possible to identify that the presence of the checklist in the service does not necessarily mean that its steps are properly executed. The literature has shown difficulties related to the admission of professionals, communication failures, absence

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or insufficient training, resistance to change and merely documentary completion. Those factors may limit the instrument's ability to effectively act as a barrier to incidents.

As regards the relationship between the checklist and adverse events, the findings indicated that the tool has potential to contribute to patient safety, although its effects cannot be attributed solely to its use. The occurrence of adverse events involves different factors such as the patient's clinical conditions, complexity of the procedure, available structure, organisation of service and interaction between professionals. Therefore, the checklist should be understood as part of a set of strategies aimed at the quality and safety of surgical care.

The involvement of the nurse in this process is particularly relevant because it involves not only the verification of the items on the list, but also actions to organise, guide, supervise, communicate and monitor the practices carried out by the staff. In this way, its action can promote the use of the checklist more effectively, provided that it is integrated into a multi-professional dynamic and supported by the institution.

In view of the findings, it is understood that strengthening surgical safety requires more than the deployment of a verification instrument. It is necessary to promote continuing education, training of staff, monitoring of membership, auditing of processes and encouraging open communication between team members. Such measures may favour the incorporation of the checklist into the institutional culture and reduce the possibility of its use being limited to filling out a form.

It is concluded that the nurse's performance in implementing the Surgical Safety Checklist is a relevant component for strengthening a safety culture and preventing risks related to surgical care. Although not solely responsible for implementing the instrument, the nurse plays an important role in organising and monitoring this process, contributing to the systematic incorporation of safety practices into care.

Finally, the importance of carrying out new national studies assessing not only the presence and completeness of the checklist but also the quality of its application, the degree of professional participation and its effects on safety indicators is highlighted. Further research on these issues could contribute to the development of more effective implementation strategies and to improving nursing care in the surgical environment.

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