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Optimizing Inventory Management in the Perioperative Period: Scoping Review

Optimization of Stock Management in Perioperative Care: A Scoping Review

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Summary

Objective: To map the strategies described in the literature for optimizing perioperative inventory management, with emphasis on the role of perioperative nursing. Methodology: Scoping review conducted according to PRISMA-ScR and Arksey & O'Malley, refined by the Joanna Briggs Institute.
A search was conducted in the PubMed/MEDLINE, Scopus, CINAHL, and SciELO databases, including studies published between 2013 and 2023 in Portuguese, English, or Spanish. Results: Of the initial 1,245 records, 10 studies were included. The most frequently mentioned strategies were the implementation of computerized systems and tracking technologies, standardization and customization of surgical kits, and training of nursing teams. Gains in inventory accuracy, reduction of waste and preparation times, and increased surgical safety were reported. Conclusion: Optimizing perioperative inventory management requires a balanced integration of technology, standardized processes, and team training, with nursing playing a central role.

Keywords: inventory management, perioperative nursing, PRISMA-ScR.

Abstract

Objective: To map the strategies described in the literature to optimize stock management in perioperative settings, with emphasis on the role of perioperative nursing. Methods: Scoping review conducted according to PRISMA-ScR, Arksey & O'Malley, and refined by the Joanna Briggs Institute. The search was performed in PubMed/MEDLINE, Scopus, CINAHL and SciELO, including studies published between 2013 and 2023 in Portuguese, English, or Spanish. Results: Out of 1,245 initial records, 10 studies were included. The most cited strategies were computerized stock systems and tracking technologies, standardization and customization of surgical kits, and nursing team training. Reported outcomes included improved inventory accuracy, reduced waste and preparation time, and increased surgical safety. Conclusion: Stock management optimization in perioperative care requires a balanced integration between technology, standardized processes, and team training, with nursing playing a central role.

Keywords: Inventory management, perioperative nursing, PRISMA-ScR

1. Introduction

Inventory management in a hospital setting is one of the cornerstones of operational efficiency.
and patient safety. In the perioperative context, the logistical complexity associated with
The diversity of materials, surgical specificity, and time constraints make inventory management a challenge.
particularly challenging. Errors in preparation, lack of critical materials, and waste.
Failures in the logistics chain directly impact operating times and costs.
hospitals and in the quality of care.

The increasing pressure to optimize resources in the healthcare sector, coupled with the demand for
Patient-centered care has driven the adoption of innovative strategies in management.
stocks. Technologies such as RFID (radio frequency identification) systems, barcodes,
Integrated dashboards and traceability platforms have been transforming processes.

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logistical aspects in surgical units. However, the effectiveness of these technologies largely depends on...
to the extent of its integration with clinical practices, care protocols, and the training of
professionals involved, particularly the perioperative nursing team.

In this context, it becomes relevant to map the strategies described in the literature.
scientific studies aimed at optimizing inventory management in the perioperative period. In doing so, the intention is to...
to understand not only the proposed technological and organizational solutions, but also the role
performed by healthcare professionals, especially nurses, in its implementation and
support. The main objective of this scoping review is to identify and systematize these
strategies, contributing to the continuous improvement of surgical care and sustainability
of health systems.

2. Methodology

This scoping review was conducted in accordance with the methodology proposed by Arksey and O'Malley, later refined by the Joanna Briggs Institute (JBI), and follows the recommendations of PRISMA-ScR.

Research question: What strategies have been described in the scientific literature for
How to optimize inventory management in the perioperative period?

Inclusion criteria: Studies published between 2013 and 2023, in Portuguese, were included.
English or Spanish, addressing the management of materials or stocks in a surgical context, with a focus
in efficiency, traceability, safety, or involvement of the nursing team. They were
considered empirical articles (quantitative, qualitative or mixed), reviews and reports of good practices.
practices.

Sources of information: The databases consulted were PubMed/MEDLINE, Scopus,
CINAHL and SciELO. The research was conducted in September 2025, using combinations of
The following descriptors: “perioperative”, “stock management”, “inventory”, “kits”, “nursing”,
“operating room”, “logistics”.

Selection and extraction: After removing duplicates, two reviewers read the titles.
and abstracts, followed by full reading of potentially eligible articles. Data extraction was
Conducted using a structured grid, including: year, country, methodological design, interventions described,
relevant results and conclusions.

Data summary: The data were organized by thematic categories, focusing on
Strategies used, their reported impact, and the role assigned to nursing.

3. Results and Discussion

The most frequently described strategies included: (Anderson et al., 2014) adoption of

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computerized inventory management systems, with real-time dashboards; (dos Santos et al., 2021) Use of tracking technologies (RFID, barcodes) for location and expiration date control. of materials; (Gomes, Santos and Pina, 2020) creation and standardization of customized surgical kits by specialty or procedure; (Silva, Rodrigues and Lopes, 2019) continuous training of teams Nursing involvement in logistics and resource management; (Oliveira, Pereira and Almeida, 2022) professionals play a role in defining essential material lists.

Among the main gains reported are: improved inventory accuracy, Reduction of losses due to expiration or misplacement, reduction of operating room preparation time, and increased perceived surgical safety. Three studies also highlighted the economic impact. from the implementation of technological solutions, with a reduction in direct costs associated with waste. of material.

The results of this review reveal a growing trend towards the integration of solutions. Technological and continuous improvement strategies in inventory management in the perioperative context. The identified principles align with those of modern hospital logistics, Lean Healthcare, and... clinical governance.

One aspect that runs through the studies is the emphasis on the involvement of the team. Nursing in materials management processes. This involvement is not limited to execution, but it extends to the definition of processes, monitoring of indicators and continuous adaptation of strategies implemented. This fact reinforces the need to include logistics management skills. in the training of perioperative nurses.

Standardization and customization of surgical kits has proven to be an effective measure in Reducing variability, improving traceability, and simplifying replenishment processes. No However, its effectiveness depends on adapting to local specificities and actively listening to... operational teams. The implementation of dashboards and decision support platforms also It has demonstrated potential for resource optimization, provided it is supported by reliable data and with... Ability to integrate into hospital systems.

Despite the identified benefits, most studies lack economic evaluations. robust and with long-term impact analyses. The scarcity of Portuguese studies highlights a national research gap in this area, which needs to be filled given the current context of Reforms in Local Health Units and a focus on operational efficiency in operating rooms.

Final Considerations

This scoping review highlighted that perioperative inventory management, although often relegated to a secondary logistical function, it is a strategic component of Patient safety and institutional efficiency. Interventions identified in the studies.

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The analyses reveal that the adoption of technological solutions, combined with the reorganization of processes and... Active involvement of the nursing team allows for tangible gains in reducing errors. waste and surgical preparation time.

A critical analysis of the studies also highlighted the importance of a hybrid model. that combines innovation and pragmatism. Technology should be seen as an enabling tool, but This is not a substitute for the clinical judgment and experience of professionals. Personalization initiatives Standardization of surgical kits, for example, only proves effective when adjusted to... The practical reality of the services, supported by the tacit knowledge of the teams.

In this context, perioperative nursing emerges as a key player, not only in execution, but also in the design and evaluation of inventory management systems. Their involvement It is crucial to ensure adherence to routines, the suitability of the materials used, and integration. of continuous improvement practices.

Beyond the logistical benefits, these practices are directly reflected in the quality of Care provided, patient safety, and the sustainability of surgical services. Management Efficient use of material resources is, today, inseparable from clinical excellence and governance in healthcare.

Future research should explore mixed methodologies that combine data. quantitative performance analyses combined with qualitative approaches to perceptions and experiences of professionals. It is also important to delve deeper into the economic impact of the different strategies adopted, promoting value-based decisions supported by robust evidence.

It can therefore be concluded that optimizing inventory management in the perioperative period is not... Not merely a logistical opportunity, but an ethical and strategic imperative for continuous improvement. surgical care.

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