Year V, v.2 2025 | Submission: 08/12/2025 | Accepted: 10/12/2025 | Publication: 12/12/2025

The beneficial effects provided by *blockchain* technology **in nursing management.**

The beneficial effects provided by blockchain technology in nursing management

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Summary

Nursing professionals need to identify the advantages of *blockchain* technology to ensure the reliability of patient record histories. Nurse managers, in the face of constant technological change, play a vital role in improving administrative and care quality.
This research aims primarily to analyze the scientific evidence regarding the benefits of *blockchain* in nursing management, highlighting the value of creative approaches to enhance management excellence. The chosen methodology was an integrative review, examining relevant works to support the selection of practices and the refinement of professional activities. The research covered the period from January 1, 2020 to September 30, 2024, in the Medline and PubMed databases. The scientific evidence indicated that *blockchain* offers numerous benefits for nurse managers, such as: validating the privacy and reliability of patient information, ensuring accurate and up-to-date information, and stimulating improvements in care coordination. Above all, the resource facilitates the planning of discharges, transfers, monitoring of fundamental information, and the instant automation of billing processes.

It also guarantees the authenticity of professional certificates, provides fluidity in communication between different areas of the sector, and establishes more economical and profitable work processes. Other benefits include improved supervision of medical-hospital materials and medications.
This study contributed to a deeper understanding of the benefits brought about by *blockchain,* highlighting its relevance in the role of nurse managers and in the advancement of nursing practices in a healthcare environment that is undergoing continuous technological advancement.
Keywords: *Blockchain.* Evidence. Nursing Management. Patient Records.

Abstract

Nursing needs to identify the advantages of blockchain technology to ensure the reliability of patient record histories. The nurse manager, facing incessant technological changes, plays a vital role in improving administrative and care quality. This research aims primarily to analyze the scientific evidence on the benefits of blockchain in nursing management, highlighting the value of creative approaches to enhance management excellence. The chosen methodology was an integrative review, examining relevant works to support the choice of practices and the refinement of professional activities. The research covered the period from January 1, 2020 to September 30, 2024, in the Medline and PubMed databases. The scientific evidence indicated that blockchain offers numerous benefits for the nurse manager, such as: validating the privacy and reliability of patient information, ensuring accurate and up-to-date information, and stimulating improvements in care coordination.

Above all, the resource facilitates the planning of discharges, transfers, monitoring of fundamental information, and the automation of billing processes instantly. It also guarantees the authenticity of professional certificates, provides fluidity in communication between different areas of the sector, and establishes more economical and profitable work processes. Other benefits include improved supervision of medical-hospital materials and medications. This study contributed to a deeper understanding of the gains brought about by blockchain, highlighting its relevance in the performance of nurse managers and in the advancement of nursing practices in a healthcare environment that is undergoing continuous technological advancement.

Keywords: *Blockchain. Evidence. Nursing Management. Patient Records.*

Introduction

In Brazil, nurses in healthcare institutions most often hold leadership positions.

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as part of a team, whether as a nursing technician or as a team coordinator of nurses, their role
The role will involve managing a team with the primary responsibility of engaging and influencing their team members.
to comply with principles and protocols established by the service. This ability to care with
Excellence and safety in nursing is established by leadership that promotes and certifies a
suitable environment (O'CONNOR, 2008). For this, innovative technologies are gaining ground in
health to accelerate the integrity of recorded data and the practices of the professionals involved.

Nurses must undergo constant professional development as instructed by leadership and senior management.
hospital with the purpose of boosting healthcare services through the professional environment.
competent (GRIFFITH and WHITE 2005). The nurse needs to be attentive to technological demands.
which includes the *blockchain system.* Thus, the focus of this research considered the nurse who deals
directly related to patient records and the technologies used at the institution. In this sense, their
Skills and knowledge will be essential to making a difference in the role of nurse manager.
(METTLER, 2016). The use of *blockchain* is vital for efficiently monitoring services.
assistance and task scheduling in medical care through a genetic algorithm.
Blockchain can be public (anyone can participate), private, or consortium (with
Access control) – used by companies and relies on an authority to grant access.
Consortia are more efficient at controlling [financial matters], which is why institutions prefer them due to the security they offer.
provided (DURNEVA, COUSINS and CHEN, 2020).

Considering this, *blockchain* applications in nursing involve management.
of “Electronic Health Records (EHR)”, optimization of nursing administration and the
Facilitating investigative processes. In the context of nursing records, the system
Blockchain can stimulate control and use of information, refine administration, and ensure...
the safeguarding and ownership of patient information, especially in research in the field (KIM,
(LEE, PENDYALA, and KUO, 2024). The nursing professional needs to be aware of the demand
The technological framework that the *blockchain* system operates on (METTLER, 2016). Therefore, the topic of interest for
This research considered the nurse directly involved with patient records and the
Technologies within the institution. Therefore, their skills and experience with technological knowledge will make a
significant difference for the nurse manager. In view of this, the main question that guided...
The focus of this study was: what are the beneficial effects provided by the technology?
Blockchain in nursing management? Because the advancement of technologies, especially human intelligence...
Artificial intelligence (AI) and the increase in technical devices make it possible to respond more effectively.
to meet the growing demands of the sector. These innovations not only allow for data optimization, but also
They also promote transparency in processes, ensuring greater integrity and reliability.
information. The integration of these technologies in the healthcare environment is an opportunity for
to stimulate organizational transformation and raise standards of excellence and safety in

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service.

Given this, this research is justified by the relevance of creative technological practices, such as The *blockchain* system for excellence in nursing administration through integrity of Records in health services. The discussion about corruption and fraud in the context of health highlights the There is an urgent need to strengthen security mechanisms to ensure the safeguarding of both Patients as well as healthcare professionals and teams. In this sense, intersectoral relationships between Health services are vital for fostering cooperation and efficiency in addressing these issues. challenges. Furthermore, creating a healthy professional environment that prioritizes safety and... Ethics are crucial for refining organizational culture and, consequently, improving results. institutional. Therefore, the main objective of this work is to analyze the scientific evidence of significance regarding the beneficial effects provided by *blockchain* technology in the institution health for nursing management. And, as specific objectives, to identify the definitions and the Beneficial effects provided by *blockchain* technology in nursing management; evaluating evidence. scientific findings regarding *blockchain* systems in nursing management; present evidence scientific evidence of the significance of the beneficial effects provided by *blockchain* technology in healthcare institution for nursing management.

Methodology

The methodology selected for the research was the integrative review (IR). It is defined as... starting from the development of an extensive analysis of scientific publications that can offer a Understanding the problem raised. The foundation of "Evidence-Based Practice" (EBP). It integrates the search for the most up-to-date and highest quality scientific evidence.

The application of scientific evidence demands skills from the nurse, as it involves and Incorporate research findings into practice to achieve positive outcomes in management excellence (MENDES, SILVEIRA and GALVÃO, 2008). The approach chosen for this research will be a This is an integrative review, with a qualitative approach, of an exploratory and descriptive nature.

Integrative Literature Review

An integrative review (IR) involves the analysis of works that have had an impact with their Contribution to the scientific community aimed at improving decision-making and refining practices. professionals. In this way, it allows for the synthesis of current knowledge on a specific topic and It identifies gaps that still need to be addressed by new studies (WHITTEMORE and KNAFL, 2005; MENDES, SILVEIRA and GALVÃO, 2008). Furthermore, it is characterized by its breadth. methodological, by including studies with different approaches (quantitative, qualitative and mixed), with the

RCMOS – Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

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The objective is to synthesize existing knowledge and provide a solid foundation for established practice. scientific evidence, also standing out for its flexibility, since although it does not follow such a rigid structure Rigorous in its systematic reviews, it adopts strict criteria to ensure the excellence of the analysis.

The purpose of this scientific study was to gather and summarize the results of investigations. considerable, aiming to offer a broad understanding of the topic addressed. In each process Next, the selected information should be stored and not deleted until all steps are completed. be ready. Identifying the research problem is followed by defining criteria for elimination and insertion, through database searches, through the selection and evaluation of studies, by Extraction and analysis of information, synthesis of results, and finally, presentation and discussion. of the findings. For this, the methodology was based on the six steps suggested by Ganong (1987):

Table 1 – Phases of the integrative review

Integrative Review		
Phase 1: Choosing the theme and selecting the guiding question that will guide the work. **Phase 2:** Inclusion, exclusion, and sample selection		• Define the problem. • Define the article search strategy. • Define the correct descriptors. • Define the database.
criteria.		• Determine criteria for including articles. • Determine criteria for excluding articles. • Perform sample selection based on the defined criteria.
Phase 3: Organization of the selected studies based on the collected data.		• Identify and organize the articles. • Reading titles, abstracts, and keywords to narrow down the selection of articles.
4th Phase: Thorough analysis of works.		• Catalog all items for identification according to the search, separating all samples. • Create a synthesis matrix to begin the evaluation of each study.
Phase 5: Analysis and Interpretation	• Conduct an interpretation and discussion regarding the outcome results found in the research.	
Phase 6: Presentation of the RI (Research Impact) with all the research findings.		• To summarize and present the findings in detail. • Proposal for new jobs.

Source: GANONG (1987).

3.1. Definition of the PICO Strategy

To identify a problem that needs to be solved, an analysis is carried out. A detailed and complete overview of the available literature on the subject, contributing to the refinement of knowledge. in the area. For this, the "PICO strategy" is used, according to Santos, Pimenta and Nobre (2007), in which the The acronym PICO refers to the fundamental elements of the research question as per Table 1 – "Population (P), Intervention (I), Comparison (C), and Outcome/Result (O)". In this sense, A clear and well-defined question is formulated using this strategy. This technique aims to assist in... The process of searching for scientific evidence that will provide the means to arrive at the appropriate intervention.

RCMOS – Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

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and provide a better result. Within the scope of this work on the beneficial effects Made possible by *blockchain* technology for nursing management, the PICO framework is presented in accordance with **Table 1** below:

Table 1 – PICO strategy for problem identification

P	Population (patient or	(Nurse problem)
I	Intervention	*Blockchain* technology in record security.
C	Comparison or control	Not applicable
The	*Outcome*	Skilled nursing management.

Source: SANTOS, PIMENTA and NOBRE (2007)

With this methodology, it will be possible to address the topic of "competent nursing management". In a broad and thorough manner, highlight the security of patient records provided by *Blockchain* technology . In this way, the aim is to contribute to scientific advancement in the field and offer significant subsidies for a more capable nursing administration. According to Kim, Lee, Pendyala, and Kuo (2024) state that nursing research involving *blockchain* is of low caliber. production, demanding new investigations to meet this accelerated process.

The research for scientific evidence was defined during the period from January 1, 2020 to September 30, 2024, conducted through a search for articles indexed on data platforms. Virtual Health Library (VHL) - *Medical Literature Analysis and Retrieval System Online* (Medline) and *the United States National Library of Medicine* (PubMed). Therefore, using the Descriptors validated by the "Descriptors in Health Sciences – DECS", according to the following combinations: *"patient records AND nursing management"; "blockchain AND AND nursing healthcare"; "blockchain* AND patient records". The selection of content was based on the Portuguese and Portuguese languages. English, freely accessible and complete, available in the Medline and PubMed databases, during the established period.

However, the parameters for eliminating the articles were:

a) Publications before and after the period from January 1, 2020 to September 30, 2024;

b) Incomplete articles;

c) Articles without open access;

d) Articles not relevant to the topic;

e) After reading the title, abstract, and keywords;

f) Duplicate items;

g) Items depicted.

The criteria for inclusion are:

a) Items on the specified date;

b) Complete articles;

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ISSN: 2675-9128. São Paulo-SP.

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c) Articles with open access;

d) Articles on the topic (integrity in records provided by *blockchain* technology in nursing administration).

e) Title, abstract and keywords *(blockchain* + nursing management and/or nursing)

3.2. "PRISMA" Review Process

The selection of studies followed the flow and analysis guidelines of the *"Preferred Reporting Items". for Systematic Reviews and Meta-Analyses* (PRISMA)" which has a list of 27 characteristics a to be fulfilled in the tabulated synthesis of samples. This RI aimed to follow these pre-determined. Similarly, the "PRISMA" flowchart assists in identifying the studies. Selected based on the elimination and inclusion criteria, organizing the assembly of the report. for later verification. The reports prepared as survey responses, for this method, They aim to be objective and clear to facilitate data collection, as well as the condensation of this information. He evaluates the impact of the investigated intervention on the population/problem through a summary. analytical of scientific evidence (PAGE *et* al., 2021).

The key difference with this method lies in the details of the sequence of all the steps. Therefore, these The steps are cited and described throughout the study, as well as the use of tools. (tables, charts, figures and graphs) that aid in visualizing and describing all information which were grouped together to be presented in the work. Through checklists, the summaries They were evaluated based on 12 criteria (title, objectives, methods, results, discussion, research funding and registration), some of which have more than 2 characteristics for analysis (PAGE *et* al., 2021).

However, the research article on the "PRISMA" methodology presents a list of a checklist with 27 defining characteristics: title, abstract, rationale, objectives, criteria of eligibility criteria, sources, strategies, research selection process, data collection process information, information items, risk assessment, effectiveness, synthesis methodology, evaluation of verified reports, assessment of evidence reliability, selection of research with a description of search, characterize the research, verify the risk of bias in the embedded research, results of Individual research, synthesis results, reporting omissions, evidence verification. reliable in its results, discussions, recording and documenting all collected scientific evidence. Describe the sources of financial support, conflicts, and the availability of final information. Some of the relationships mentioned, more than 3 items are characterized, giving a total of 27 (PAGE *et* al., 2021). In view of this, the data collection followed the flow diagram of Page *et al.* (2021), **figure** 1. Initially, a defined search was carried out for proper identification using the descriptors in Medline and PubMed. Proceeding to a more focused detection process with inclusion and exclusion criteria.

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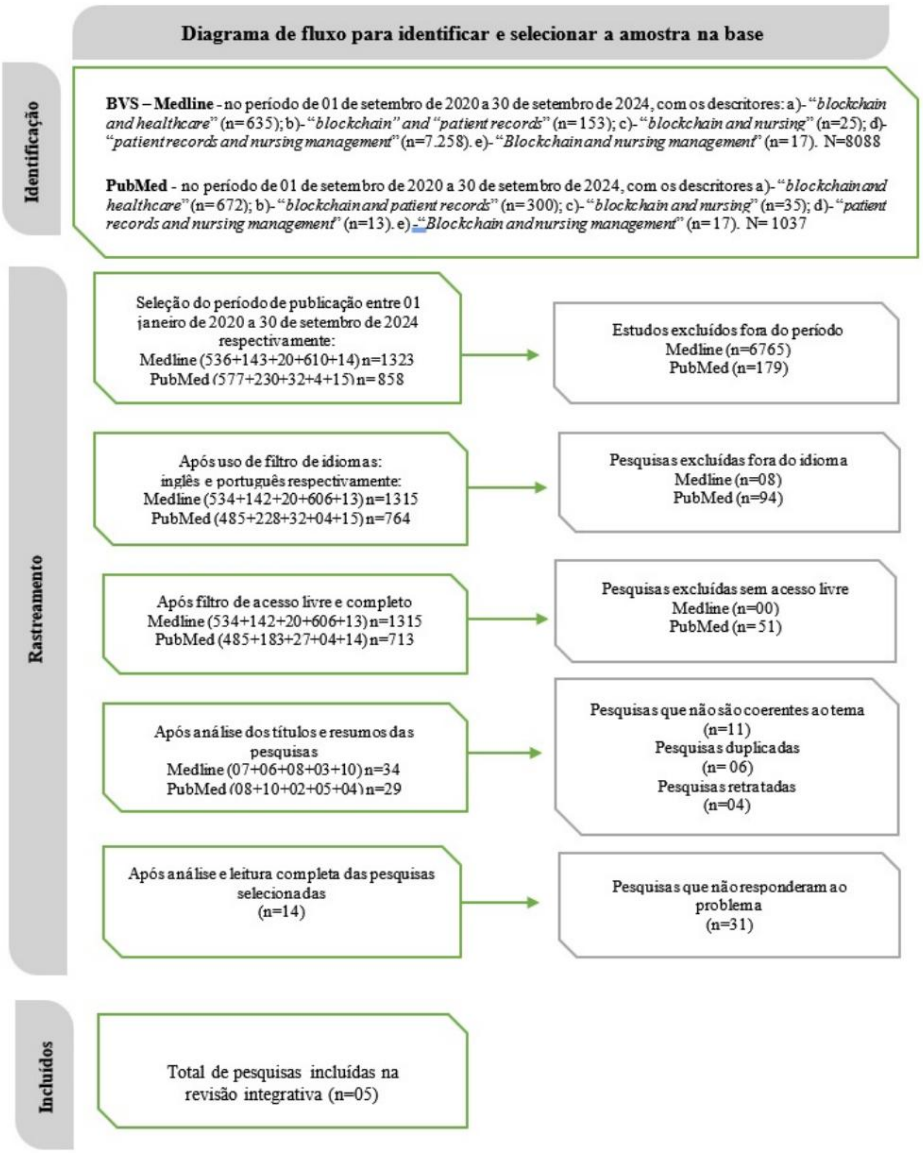
to eliminate research that is not relevant to the topic.

Figure 1: Flowchart for identifying and selecting research subjects for sampling.



Source: Adapted from Page *et* al., 2021.

During the study selection phase on the platforms **(Figure 1),** the following were used:
same descriptors with their previously established combinations. In this way, the search was
The investigation was conducted using the same criteria, which provided greater reliability. After the
The identification of studies using specific descriptors and dates initiated the tracking process using filters
(language, open access, full text, and relevance to the topic, respectively). As
that passed through each of the filters, those that did not meet the criteria were excluded, separating the
selected for a further filter. In the final stage of the process, after reading the abstracts and the title, the
The selection process was more rigorous, allowing only searches within the search engine *(blockchain* and
(nursing administration) remained. Therefore, 14 studies remained for further reading.
complete identification of the theme within the work. Following this, 5 research projects were recognized.

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that addressed the study's theme for the creation of a tabulated synthesis and subsequent analysis of the research.

3.3. The ***Blockchain*** **Structure in Healthcare Institutions**

Blockchain technology has brought considerable changes to all sectors. Its distinctive features such as a differentiating technique, according to Mettler (2016):

- Privacy;
- Security;
- Transparency;
- Interoperability;
- Product tracking;
- Smart contracts;
- Elimination of intermediaries.

The literature reports the relevance of technological innovation due to the various benefits it brings to... Optimization of processes and secure practices within the institution. *Blockchain* was introduced in online marketplace based on the virtual currency Bitcoin, to provide security in transactions without these information could be accessed by others. It is based on a block structure with a A ledger where everything that is done is recorded and cannot be erased or corrected, and it operates in a way that... Decentralized. The *blockchain ,* as it is currently structured, often presents some problems. for use in the services, which required the establishment of a new platform *(Etherium)* for meeting the demand (METTLER, 2016). The biggest secret to *blockchain* 's success lies in The identities of the negotiators are no longer linked; there is no way to know who conducted these negotiations. In this way, the professional manager can offer an intelligent healthcare process for patients. and the institution; all parties access the same data. It empowers the patient who then becomes able to... part of his treatment. Because he has access to information that also involves screenings. necessary for continued treatment. All input and output of information is recorded and cannot be... to be deleted. The drug tracking process helps in gathering the information. to enhance intelligence, progressively improving patients' health with treatments. and reliable medications. This makes it possible to ensure the reliability of medications and improvement in their costs (METTLER, 2016).

In this way, the nurse manager needs to be aware of the technological demands that... The *blockchain* mechanism is part of it. Therefore, the topic of interest for this research considered the A nurse directly involved with patient records and technologies at the institution. By For this reason, their skills and experiences will make a significant difference to the nurse manager. (METTLER, 2016). Thus, the nurse manager is directly involved with processes of qualified assistance. Management programs are increasingly dependent on software. Intelligent and autonomous in clinical resolutions, analytical study of data, and structuring of plans.

RCMOS - Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year V, v.2 2025 | Submission: 08/12/2025 | Accepted: 10/12/2025 | Publication: 12/12/2025

strategic for achieving better results. To this end, artificial intelligence plays a key role.
Optimization and specialization dynamics to eliminate excessive spending, fraud, and errors.
Planning patient flow schedules and demand with smart solutions, diagnostics and
precision treatments, smart prescriptions, and others (WHO, 2021). For this reason, the adoption of
New systems and technological resources are needed to promote the integrity of information.
An excellent example is how *blockchain* platforms in healthcare can operate in a cloud model.
However, many of them use the cloud as part of their infrastructure due to the advantages it offers.
offers (METTLER, 2016).

3.4. *Blockchain* in the Security of Recorded Healthcare Records

The confidentiality of registered patient information has increased considerably.
following the "General Data Protection Law - LGPD - (Law No. 13.709/2018)" in Brazil. It
regulates the treatment of personal information, differentiating the types of information and
establishing rights and obligations for all parties, whether individuals or legal entities. As well as,
guarantees the privacy and integrity of the information provided, with penalties (high fines) in case of violations.
violation (BRAZIL, 2018). Therefore, companies that collect, process and store these
The information was adapted by preparing it with resources and processes to avoid problems. However,
In the United States, there is no single federal law that regulates the safeguarding of information. It is
The combined laws of states and various sectors, along with their regulations, can create legal differences.
among all (GRADIM, 2020).

Yazdinejad et al. (2019) presented a decentralized authentication project for a
Hospital complex based on *blockchain,* to enable significant improvement in revenue and in
costs of the institution. Its articulated system was built to integrate the headquarters with the branches through
of the public *blockchain* and the institution's IoT (Internet of Things - network of physical objects). These
Systems are designed to meet administrative and healthcare demands with integrity in
Sharing and storage benefits the entire hospital network.

The strategic management of a service involves a policy such as the creation of objectives.
and the institution's priorities, in addition to an improved strategy design, with a process of
Careful implementation and monitoring of this plan, allowing for possible changes if necessary.
(TULCHINSKY & VARAVIKOVA, 2014). The control of processes, systems, and people has the
The purpose is to increase results to provide greater profits and rationalize expenses for services. Therefore,
qualified product and service management is essential. In view of this, the...
Nursing notes carry significant weight in the documentation inspected by
Auditing is important because nursing is directly involved with the patient. Their information is...
Recorded by the team and supervised by the nurse manager. In this way, the records of all
The procedures must be documented in a complete report including the date, time, and type of...

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ISSN: 2675-9128. São Paulo-SP.

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professional who will perform the procedure, material and medication costs, along with the information.
of the patient and their general condition at the moment (PADILHA and MATSUDA 2011). That being said, the system *Blockchain* is growing rapidly to meet the demand for a technology that offers integrity and Privacy in patient records in the healthcare environment. These are the most commonly used areas. "the records" (HASSELGREN, KRALEVSKA, GLIGOROSKI, PEDERSEN, and FAXVAAG 2020).

3.5. Competent Nursing Management for the Integrity of Recorded Medical Records

The skills and competencies developed by leadership will be the differentiating factor in the demand. hospital. From good communication between both directions and established standards, the institutions Health professionals work to share, evaluate, and analyze the information that should be disclosed to Everyone. Instill a culture of service as mission, vision, and values; evaluate and encourage communication. bidirectional; the retention of efficient employees (GRIFFITH and WHITE 2005). More Specifically, among the elements that describe good management, there is the time consumed. with excellence and integrity (team and patient) through influence on service collaborators. (PARAND, DOPSON, RENZ and VINCENT, 2014). Therefore, the power of involvement of the leader and the His followers were conceptualized by Burns (1978), in which he demonstrates the relationship between both with Effective production of motivation and reflex generated from one to the other continuously. Therefore, it is a Leadership that transforms and motivates the team in a continuous process that influences the attitudes of the team members. collaborators which has an impact on the results (BURNS, 1978, cited by STEWART, 2006; GIVENS, 2008).

In light of this, proficiency in nursing care is fostered by leadership aimed at... to promote and ensure that the environment is safe and provides excellent care (O'CONNOR, 2008). For this reason, creative technologies are gaining ground in healthcare to accelerate the integrity of medical records. documented and within the professional practices of those involved. The nurse's technical skills must to be constantly updated by the leadership and senior hospital administration. (GRIFFITH and WHITE 2005). According to Hasselgren, Kralevska, Gligoroski, Pedersen, and Faxvaag, (2020), the nurse is always ready to face challenges and has a knack for absorbing information. of the new demands required for technologies that ensure the effectiveness of decision-making.

Considering this, *blockchain* technology offers interoperability because it is able to... Communicate with all other structures without compromising information or those involved. No. It only uses devices associated with the Internet of Things, with signable contracts, control of economic and material resources with greater control and tracking. It is defined as a A transparent and secure platform that offers various benefits for both the client and the healthcare worker. (MOLE and SHAJI, 2024). Consequently, patient follow-up through these The system and sensors continuously alert us whenever necessary to changes in the information.

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vital aspects of him. Thus, the healthcare professional will be able to act according to the patient's needs. It offers autonomous recording of information, continuously supported by the users themselves. professionals who access this information. This information is stored in the cloud to avoid conflicts. space in the memory of the hardware in use, being an interconnected system for access from any sector. or function in the service (GLENNON, 2024). This information is supported and collected for Sharing via devices in different locations, improving assistance to The patient and the clinical and managerial decision-making process. The recorded electronic history facilitates the supplementing and potentially informative data collected from the patient, assisting in diagnostic findings. and in the most effective treatments monitored by the system that offers all the resources Ready for the professional. Therefore, with the refinement in treatments and effective diagnoses, it is It is possible to offer greater integrity to both patients and professionals, with excellent care. In strategic management, surgeries are assisted with precision and improvement through... Robotic automation. Optimization of structures and procedures occurs 24 hours a day. institution in a synchronized manner (NISIYAMA & OYADOMARI, 2012; LEE and YOON, 2021). From Similarly, it can offer better responses in patient self-care and with their Involvement is due to the way data is divided across personal devices by the healthcare service. It provides. Because it offers more favorable results in chronic and critical treatments, in addition to promoting Motivation and satisfaction with the service. Improves the reliability of the information processed and analyzed, to offer integrity to the professional and the institution with a reduction in errors that It is practically not implemented in the system. Furthermore, effective preventative measures are lacking due to... The availability of information provided to the manager immediately prevents future complications. and promoting patient health. The various advantages provided to the professional, as well as the health institution progressively enables the effective performance of the company and its inputs in its value chain (NISIYAMA & OYADOMARI, 2012; LEE and YOON, 2021).

Smart devices are common in large hospitals. They are Used with the intention of treating, curing, and rehabilitating clients, and depend on an expert. a qualified health technician (CHEN *et* al., 2019). However, due to the presence of patients, it is I need nursing staff to be present to assist professionals with procedures or to circulate the room (rehabilitation with robotic systems, robotic surgeries, and others). The specialists of "Generative AI" (algorithms that create new and original content) must be equipped with the technological skills to meet market needs (WANG *et* al., 2017). And Thus, training is the essential strategy for qualified leadership, whose goal is to encourage... your team in the pursuit of professional technical improvement. The nurse manager plays a role influence in the work environment, affecting the behavior of the team. In this way, it acts improving everyone's professional performance by motivating decision-making for assistance of

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excellence for the patient (TOMEY, 2009).

Results

It was observed that the search in the Medline and PubMed information structure was voluminous. Initially, however, in order for the descriptors "nursing" and *"blockchain"* to be present in The content, however, was considerably reduced. A significant lack of content was observed. Nursing research using the *blockchain system.* A total of 9125 texts were researched. Only 5 pieces of evidence were included following the selection parameters (eliminated and inserted). As explained, most articles contained the descriptors, but only a few... citations present in the text, without information relevant to the research. There were articles with The text contained descriptors related to nursing, but the word was not mentioned. Some works They demonstrated the relevance of *blockchain* and the engagement of nursing with technology, but These were studies entirely focused on engineering or artificial intelligence (AI). According to Oliveira and Levkowitz (2003) and Felizardo, MacDonell, Mendes and Maldonado (2020), the tables and graphs Comparative results in research facilitate visualization for clear analysis and It aims to identify the differences or similarities between information from different variants:

- They facilitate the understanding of trends, patterns, and variations in complex information, making The most accessible and intuitive information.
- They highlight direct comparisons, evidenced by the outcome of a variable and its behavior. in relation to one another, whether between study groups, treatments, or moments in time.
- They aid in decision-making, allowing for an investigation of impact, choices, or strategies. based on a visual analysis.
- Support the communication of findings appropriately, especially when it comes to presentations. of results for diverse audiences. Thus, to better explain the results collected from Flowchart (Figure 1), the entire process was projected onto the graphs for comparison. better filtering of studies.

In accordance with **Figure** 1, the following graphs demonstrate the filtered results. respectively as shown in the flowchart presented for sample selection. Initially, the first selection without a defined date was not represented in the graph. However, the **graph 1** with a specific date was defined (January 1, 2020 to September 30, 2024) already highlights the large disparity in the amount of scientific research on "Patient records and nursing "management" between Medline and PubMed, where Medline presented considerably different results. significant. In the other descriptors, the numbers are more similar.

RCMOS – Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

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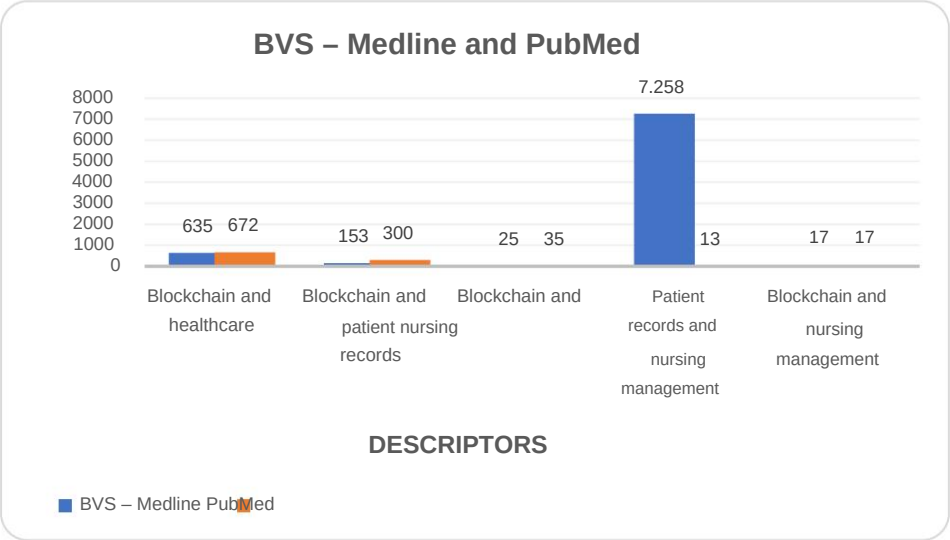
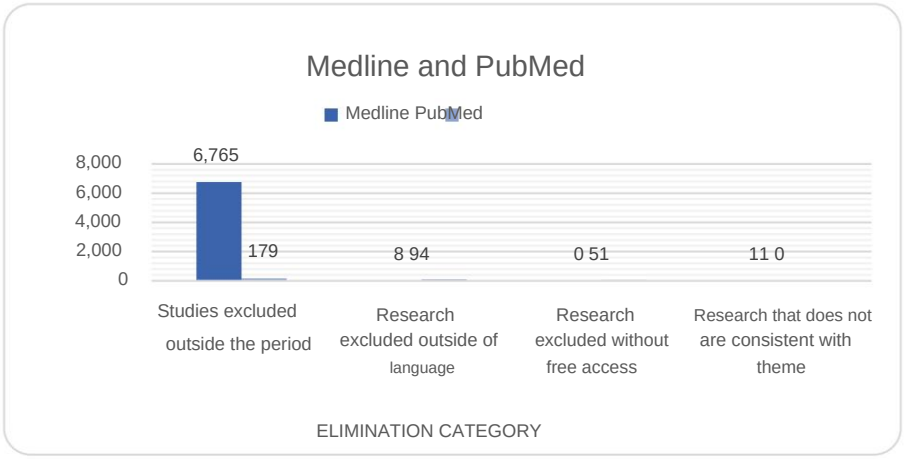
Chart 1 – Descriptors with a specific period



Source: Prepared by the author herself.

Graph **2** shows a direct comparison between Medline and PubMed regarding the number of Studies were excluded in different categories, highlighting exclusions outside the period for Medline. However, research excluded from outside the language is highlighted in PubMed in research excluded outside of the language.

Chart 2 – Elimination Category



Source: Prepared by the author herself.

Graph **3** demonstrates the last group of variables in the filtering. It offers a clear view of... distribution of the deletions, highlighting that a large part of the deleted research was that which did not They aligned with the study topic. Duplicate and retracted research represented a smaller portion. of total exclusions.

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ISSN: 2675-9128. São Paulo-SP.

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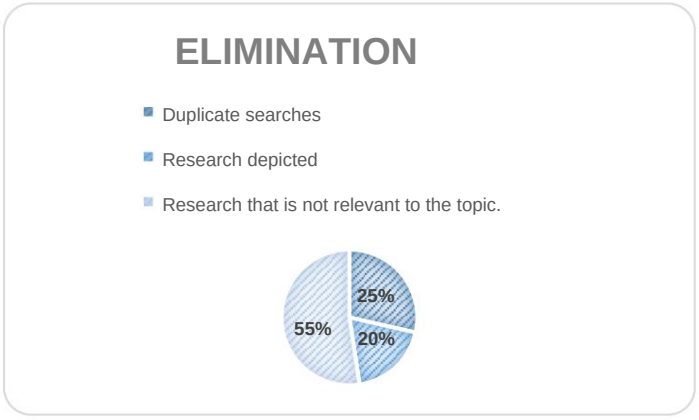
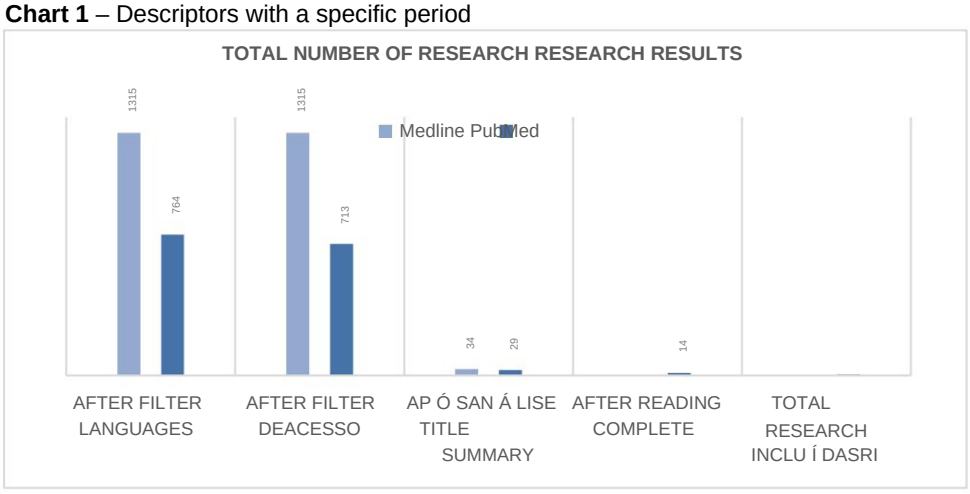
Chart 3 – Elimination – not consistent with the theme, duplicates and portrayed



Source: Prepared by the author herself.

Graph **4** presents the final stage of sample selection, demonstrating a clear difference. considerable filtering. In the selection, 34 studies were found in Medline and 29 in PubMed for reading. titles and abstracts. Thus, 14 studies were selected for full reading and indication of Selection criteria according to the theme *(blockchain* and nursing administration). Thus, For the final selection, 5 studies remained in the sample (4 from Medline and 1 from PubMed). presented in the tabulated summary as shown in **Table** 2.

Chart 1 – Descriptors with a specific period



Source: Prepared by the author herself.

Therefore, with the selected sample totaling 05 scientific investigations (04 Medline and PubMed), the verification of each selected study began. With another reading a more rigorous approach to selecting the information present in each article. For this purpose, a The table named by Ganong (1987) as a “synthesis matrix” (tabulated synthesis). It is configured as a structured tool such that its visualization and analysis of the inserted components The use of a grid in each row and column facilitates the collection of scientific evidence. It is used in integrative reviews. To organize, summarize, and compare information extracted from various sources. Its projection It facilitates critical investigation and the articulation of information, helping to identify patterns.

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Differences and gaps. Below is a summary of the systematization of scientific evidence **(Table** 2) for

This integrative review was constructed based on information collected from the articles in the final sample.

For this purpose, the information verified in each survey followed the parameter of: evidence.

scientific sources, source of information consulted, year of publication, article title, author.

article, journal or source with (volume/pages/year), article level (category) scientific and

Important considerations.

Table 2 – Systematization of scientific evidence for integrative review

Evidence Scientific	Database	Year Title	Author	Periodical the/ source (vol/page/ year)	Type 1 / Level	Considerations
P1	BVS - Medline	2020 *How blockchain can improve nursing*	Carroll, W. M.	*Nursing,* 2023, 50(8), 62-63.	Type 6 (Qualitative scientific article) the) -Low	This demonstrates the importance of connecting schools with each other using credentials. To achieve this, *blockchain* provides secure record keeping, prevents tampering, and facilitates secure data sharing.
P2	BVS - Medline	2021 *Blockchain IoT-driven nursing planning workforce for effective long-term care management in nursing homes.*	Tsang, Y. P., Wu, C. H., Leung, PP, Ip, W. H., & Ching, WK	*Journal of health re engineeri ng,* 2021(1), 9974059.	Type 4 (Case study intervention) the prospective the) -High	The study demonstrates the efficiency of the *blockchain* structure for optimization through the decentralization of care-related information, enabling proper patient monitoring. An algorithm for solving team problems. It structures processes and improves decision-making. It reorganizes and plans the team. The association of *blockchain* and the Internet of Things (IoT) simplifies the method of managing and organizing the activities of the nursing team.
P3	BVS - Medline	2022 *Is Nursing Ready for Education Blockchain Technology?*	Frith, KH	*Nursing Education n Perspective ves,* 43(2), 139.	Type 6 (Scientific article) qualitative the	Blockchain offers new means of secure accreditation for identification and certifications in schools *and* universities for professionals.
P4	BVS - Medline	2024 *A Comparative Study for Blockchain Applications in Nursing Informatics.*	Kim, H., Lee, C., Pendyala, D., Ng, A., & Kuo, T. T.	medRxiv , 202402.	Type 5 (Revision) - Moderate	It improves the quality of outcomes for both the patient and the professional. A study demonstrating the adoption of *blockchain* in countries with the Internet of Things. (IoT) in nursing (record security, optimizes control, facilitates all processes). *Blockchain* is still in its early stages in nursing. *Blockchain* applications in nursing involve the management of Electronic Health Records (EHRs), optimization of nursing management, and facilitation of research processes. In the context of nursing records, the *blockchain* system is capable of promoting control and use of information, improving management, and ensuring the protection and ownership of patient data, especially in research in the field.

[1] Galvão, CM (2006). Levels of evidence. *Acta Paulista de Enfermagem, 19,* 5-5. https://doi.org/10.1590/S0103-21002006000200001

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P5	PubMed 2024		*Technology snapshot in nursing:* *Yesterday and tomorrow.*	Glennon, -Type 6 e:	*Asia-Pacific Journal of Oncology Nursing,* 11(4).	(Scientific article) qualitative the) -Low	Technologies are rapidly becoming part of nursing, which is continuously adopting these new methods, enhancing... Excellence in care. Nursing can influence technology in various ways within practice and the profession. Nurses seek to update their technological skills to meet the operational demands of new devices in the workplace (automated pumps, smart monitors, wearable devices, among others).

Source: Adapted from (GANONG, 1987).

The studies analyzed in the tabulated summary highlight the potential of *blockchain* for transform nursing practice, especially when combined with other tools. technological advancements, such as the "Internet of Things (IoT)". Key applications include the integrity of Electronic health records, nursing team management, and accreditation. educational. Despite this, scientific evidence shows distinct levels of growth and implementation, ranging from initial applications to more structured proposals. The stages of Scientific evidence varied in intensity, focusing on qualitative studies and... revisions.

a) **The relevant contributions that this research raised were that the articles demonstrate how *blockchain* can:**

- Validate the integrity and reliability of recorded health information and process histories. educational (P1, P3, P4);
- Optimize the management of nursing teams through decentralized systems, allowing better planning and deliberations (P2);
- To facilitate technological development in nursing practice, driving improvements in assistance and in the organization of care (P4, P5).

These innovations demonstrate that *blockchain* and associated technologies are promising tools. although they are still in the early stages in some contexts, such as clinical nursing and educational.

b) **Gaps detected:**

Despite the progress made, some gaps are noticeable:

- Initial adoption phase: Many studies highlight the use of *blockchain* infrastructure in Nursing is still under development (P4).
- Limitations in qualitative studies: a significant portion of the studies present a level of evidence low or moderate (P1, P5), indicating the need for more rigorous research. methodological.
- Limited geographic focus: Few studies discuss global implementation, with particular emphasis on most technologically advanced regions (P4).

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c) Correspondence with the purpose of the Review:

The findings corroborate the exploratory purpose of how *blockchain* can to positively impact the execution of nursing activities. Scientific evidence suggests that its implementation can bring benefits, such as greater data integrity and efficiency. It is operational, but requires advances in studies and policies to achieve greater applicability.

d) Transition to Critical Examination:

A course of action was outlined based on the results, therefore the next section will discuss the implications of leveraging *blockchain* for the nursing profession, highlighting How can these technologies be integrated into care and administration, in the same way that... Obstacles must be overcome.

Discussion

In accordance with the tabulated summary **(Table 2),** a connection was found between institutions with integrity due to the *Blockchain system.* It provides power to Information can be entered and exited without risk. However, it does not allow for errors or corrections, preventing adulterations, and promoting secure and decentralized sharing without identification between schools, universities and institutions. Numerous advantages for nursing administration and for the services were detected in the use of *blockchain* (FRITH, 2022; CARROLL, 2023; KIM, (LEE, PENDYALA, E KUO, 2024). Efficiency was observed in the follow-up of patients by Through the decentralization of information, *blockchain* facilitates proper monitoring . of patients, ensuring continuous care. As well as optimizing collective effort: Algorithms help structure processes and improve decisions, reorganize and plan teams. nursing. It was also found that *blockchain* and the “Internet of Things (IoT)” form a Excellent technological combination in nursing: simplifies the administration and organization of Team activities, promoting performance (KIM, LEE, PENDYALA, E KUO, 2024). Furthermore, It promotes the safeguarding of privacy, as it allows for the secure sharing of this information. It will also bring about transformation in the accreditation of academic professionals. It improves the excellence of results through the application of these technologies (TSANG, WU, LEUNG, IP, E (CHING, 2021). And, this excellence in patient care and professional impacts presents better values. It was also verified that there is an urgent need for technological adaptation in nursing to... To fill this gap, *blockchain* is being incorporated into nursing, especially in relation to... IoT: Optimizing processes, ensuring integrity, and reducing costs.

It has been noted that the nursing profession is constantly changing to adapt to new... technologies, using them to refine the excellence of care and influence development.

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Technological innovation in the sector for the teams. Flaws were found in the *blockchain* system within the service. healthcare, due to its more recent expansion in the sector. Adjustments are therefore necessary. Financial *blockchain* for the hospital sector (GLENNON, 2024).

However, applications and programs need to be refined to adequately serve the sector. The systematic pursuit of professional development fosters new skills and competencies. consistent with technical innovation. RI has its applicability in research in the health field and of nursing. It encourages an understanding of significant topics and motivates the nurse to... best practices with policy guidelines and the development of new evidence-based protocols scientific (GLENNON, 2024). Therefore, *blockchain* can bring several benefits to the manager. nurse, improving the efficiency, integrity and transparency of care processes and administration. Below are some of these beneficial effects provided according to (METTLER, 2016; TSANG, WU, LEUNG, IP, E CHING, 2021; FRITH, 2022; KIM, LEE, PENDYALA, and KUO, 2024). It also offers an immutable record history structure, ideal for storing Sensitive information, such as medical records, is protected. In this way, it ensures that the information of patients can be accessed in a safe and transparent manner, allowing only individuals Authorized users can view or modify these records. For the nurse manager, this functionality It is crucial for validating the privacy and integrity of patient information. Furthermore, it allows... to track the supply chain of medical and hospital materials, ensuring the authenticity of the supplies and preventing fraud, such as the circulation of counterfeit medications. The nurse manager. You can use this technology to manage inventory more accurately, tracking its origin and... The route of medication delivery, in addition to minimizing losses caused by errors or mismanagement.

With the use of smart contracts, internal processes, such as scheduling, Audits and compliance checks can be automated, reducing the need for supervision. manual. This makes the processes more explicit and auditable, allowing the nurse manager... Implement efficient workflows with a lower margin for human error. Hospitals and clinics. They often use different IT systems, making communication between departments difficult. and institutions. Blockchain *facilitates* interoperability between these systems, enabling the Secure sharing of information between doctors, hospitals, and laboratories. This improves... patient care, enabling the nurse manager to ensure smooth communication in different areas avoiding data loss or delays such as:

a) - Verification of Professional Certifications and Skills:

• *Blockchain* aims to register and validate certifications and qualifications for the entire nursing profession. This allows the nurse manager to quickly verify the credentials of their team, ensuring they meet training requirements and facilitating compliance audits.

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b) - Efficient Payments and Billing:

- In the administrative field, this structure can optimize billing, providing greater transparency and preventing errors or fraud in charges. Financial transactions between patients, companies, and operators can be automated and monitored in synchronized mode, reducing the administrative burden on the nurse manager. Therefore, its use enables synchronized sharing by the multidisciplinary team, optimizing patient care, including doctors, nurses, and therapists. This ensures more effective coordination, facilitating the planning for diagnosis, treatment, and discharge, supervision of treatments, and effective communication.

- Since transactions and changes to information on the *blockchain* are recorded and verifiable, the possibility of fraud, errors, or conflicting information in the records is reduced. This helps the nurse manager ensure that patient information is reliable and up-to-date.

Therefore, the results of this review show that *blockchain* has the potential to...
to produce significant changes in nursing activities, especially in areas such as
integrity of records, team management, and education. This technology, by offering a
A decentralized and secure platform can solve historical challenges of the profession, such as...
Safeguarding sensitive information, ensuring data traceability, and optimizing processes.

a) Integrity and reliability in records:

Studies have highlighted that *blockchain* promotes the integrity and reliability of...
Recorded histories, preventing tampering and ensuring the management of information (P1,
P4). This capability is crucial in a scenario of increasing cyber threats and the demand for
safeguarding patient privacy. Furthermore, its adoption for educational processes, such as...
The secure accreditation of professionals reinforces its applicability in different areas of the profession.
(P1, P3).

b) Team management and work methods:

The integration of *blockchain technology* with the Internet of Things demonstrates great potential.
for the management of the nursing team and operational planning (P2, P4). Solutions such as
Decentralized algorithms help in organizing scales, optimizing the decision-making process for
to promote profitability. These gains have a direct impact on the excellence of care and well-being.
of professionals, contributing to a more organized and adaptable work environment.

c) Technological adoption and practical impacts:

Technological advances in nursing, including devices such as monitors.
Smart and wearable devices reveal that the profession is becoming increasingly integrated into
innovations (P5). *Blockchain* can leverage these technologies by providing an infrastructure
which ensures the integrity of information and improves interoperability between devices. No
However, integrating new technologies into daily practice requires a continuous effort of
Employee development and improvement, which still represents a significant challenge.

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d) Despite the benefits mentioned, the application of *blockchain* in nursing faces barriers:

• Early development phase: Most applications are still in experimental stages.
(P4), limiting its practical dissemination.

• Low level of evidence in qualitative studies: Many of the studies analyzed have limitations.
methodological, which makes it difficult to expand the results (P1, P5).

• Infrastructure and cost: Implementing *blockchain* systems on a large scale requires a budget.
available and technical, which is not accessible to all companies.

5.1. Presentation of the Integrative Review (IR)

To carry out this research, it was first defined that it would be an RI. From this
Thus, articles with an impact on information platforms related to the subject were searched in the literature.
concepts and requirements for compiling the RI that guided the execution of its 6 phases. Right in
Next, the parameters for searching for scientific evidence were defined and the topic was determined (a
(Blockchain integrity in nursing management records). Thus, the question arose.
guiding this investigation based on the PICO strategy (P – Nurse, I – *Blockchain* technology).
In the integrity of the records, C – N/A, O – outcome). Thus, the correct descriptors were assigned.
on the Health Sciences Descriptors (DeCS) website. Then, the databases were determined.
Information (from BVS-Medline and PubMed) was used to initiate the active search. The flowchart was used.
PRISMA for progressive selection of articles (Medline n=8088; PubMed n=1037). A
Analysis and synthesis table (table with 5 final articles from the organized samples (Ganong, 1987):
For this purpose, the defining characteristics of the PRISMA method analysis were followed (Page *et* al.,
2021). In this way, it was possible to choose the selection criteria (previous publications and
subsequent to the date; incomplete; without free access; off-topic; duplicates - 6 and retracted - 4
(articles). The selection of articles was severely hampered by the lack of texts on the topic. After the
After selecting the sample and following all criteria, the elimination step was maintained through reading.
from the title, abstract, keywords, in addition to a complete reading of the articles in the sample (n=5).
continuing the work with the study and verification of the results of scientific tests.
From the selected data, graphs 1, 2, 3, and 4 were created to study the collected information. In this way,
With the elements and the study, it was possible to conduct the discussion and final considerations.

A lack of research on the topic was observed, along with a significant need for...
New research involving nurse managers in the use of creative technologies within the framework...
blockchain. Based on these reports, it is understood that the contributions of this IR to the practices
The managerial and clinical skills of the nursing professional are vital for their technical development.
scientific. Therefore, it contributed to the theoretical and experiential understanding of beneficial outcomes.

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The role of *blockchain* technology in healthcare and management. A gap in studies on the subject. This demonstrates the urgent need for scientific production on the subject.

This investigation revealed that *blockchain* technology has great potential for transform nursing activities, providing significant advances in areas such as Information integrity, team management, and education. The studies analyzed reinforce this. that the application of the *blockchain* framework offers robust solutions to historical problems of profession, such as the vulnerability of electronic health records and the difficulty of planning. efficient teamwork. Furthermore, when integrated with other technologies, such as the "Internet of Things". "Internet of Things (IoT)", *blockchain* can simplify processes, optimize management and increase efficiency. excellence in care.

Despite the promising evidence, the results also indicate important challenges to... These challenges need to be overcome. The establishment of *blockchain* is still in its early stages, with limitations. Methodological flaws were found in some of the reviewed studies. Furthermore, there is an urgent need for technological infrastructure. Adequate training and professional development are barriers that require attention from institutions and individuals. public policy leaders.

Final Considerations

This integrative review investigated scientific evidence of significance regarding the effects. benefits provided by *blockchain* technology in healthcare institutions for management of nursing. It also identified the definitions and examined the scientific evidence for to present it. It was found that for the nurse manager, the *blockchain* system can: validate the privacy and integrity of patient information; ensuring that the information is reliable and current guidelines, encouraging improved care coordination; facilitates the strategy for high patient flow and transfer rates; effective patient supervision and communication; improved Automated invoicing synchronizes the billing process; enhances the authenticity of certificates. professionals; ensures the smooth flow of data between different areas in the sector without loss or delays; It implements more efficient workflows; it improves and facilitates the supervision of supplies.

The gap in studies in this area makes it important to encourage new research in management. Nursing in the use of *blockchain* technology . The contributions of this innovation to management practices and Clinical experiences for nursing professionals are vital for technical and scientific development. Therefore, This demonstrated both theoretical and experiential understanding of the effects of *blockchain* technology. For nurse managers, this is essential. Furthermore, it contributed to deepening the gains. highlighting its relevance in the role of the nurse manager, which is in continuous advancement. technological. Therefore, it is essential to invest in research with greater methodological rigor for a purpose. to expand understanding of *blockchain* applications in nursing administration, as well

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how to promote policies and initiatives that favor its adoption. With these advances, *blockchain*

It can establish itself as an essential tool for modernizing active nursing, ensuring

Greater integrity, efficiency, and excellence in patient care.

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