

# The Influence of Nursing Interventions on Patient Outcomes: A Systematic Review

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## Keywords

Nursing interventions · Patient outcomes · Influence · Systematic review

## Abstract

**Introduction:** Nursing interventions encompass a wide range of activities, including physical care, emotional support, patient education, medication administration, and coordination of healthcare services. They play a significant role in patient outcomes. **Aims:** This study aimed to identify the most effective nursing interventions for improving patient outcomes. **Methods:** A systematic review was conducted to examine the impact of nursing interventions on patient outcomes across various healthcare settings. Six studies were included in the review. A comprehensive search was performed using databases such as the Cochrane Library, Google Scholar, Web of Science Core Collection, PubMed, and Scopus. Only studies published in English between January 2000 and December 2022 were included. A structured process was followed, including study selection, data extraction, aggregation of findings. **Results:** Findings

from these studies demonstrate the positive outcomes associated with specific nursing interventions in various healthcare settings. Analysis of the selected studies revealed that nursing interventions had a significant impact on improving patient outcomes. Interventions such as patient education, medication management, infection control, pain management, wound care management, and fall prevention were found to be effective across different healthcare settings. **Conclusions:** Overall, the findings from this review demonstrate the positive outcomes associated with specific nursing interventions in various healthcare settings. Implementing these interventions can improve patient outcomes, enhance patient safety, and contribute to better overall healthcare quality.

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## Introduction

Nursing interventions play a significant role in patient outcomes [1]. Nurses are responsible for implementing interventions that are aimed at preventing

illness, promoting health, and providing care to patients [2]. The implementation of nursing interventions is essential in enhancing patient outcomes and guaranteeing the provision of exceptional patient-focused healthcare. Nursing interventions are defined as actions taken by nurses to promote health, prevent illness, and manage the physical, emotional, and social needs of patients [3]. These interventions can include a range of activities such as patient education, medication management, infection control, pain management, and fall prevention [4]. Pain management interventions, including the use of non-pharmacological approaches and pharmacological approaches, were found to be effective in reducing pain intensity and improving patient satisfaction [5, 6]. Patient education was found to be a highly effective nursing intervention in improving patient outcomes, including improved knowledge and understanding of the condition and improved adherence to treatment plans, and medication management interventions, such as medication reconciliation and medication reviews, were effective in reducing medication errors and adverse drug events [7]. Patient education has been shown to improve patient outcomes such as increased knowledge and understanding of the condition, improved adherence to treatment plans, and improved self-management skills [8].

Medication management interventions, including medication reconciliation, medication reviews, and patient education about medication use and side effects, can reduce medication errors and adverse drug events, improve medication adherence, and minimize the risk of drug interactions [9]. Infection control interventions, such as hand hygiene and isolation precautions, were effective in reducing healthcare-associated infections and improving patient safety, and implementation of infection control measures, including but not limited to hand hygiene, isolation protocols, the use of personal protective equipment, and maintaining cleanliness in the surroundings, can minimize the likelihood of healthcare-associated infections and advance patient safety [10, 11].

Fall prevention interventions, including patient education about fall prevention, use of assistive devices, and environmental modifications, can reduce the risk of falls and fall-related injuries, particularly in older adults who are at increased risk of falls [12]. The effectiveness of these interventions in decreasing falls and associated injuries underscores the critical role played by nurses in enhancing patient outcomes and ensuring the delivery of exceptional patient-focused healthcare [13]. Therefore,

this study aims to conduct a more comprehensive evaluation of the impact of nursing interventions on patient outcomes, utilizing the findings of the systematic review.

## Materials and Methods

### *Search Strategy*

The search strategy included a combination of keywords related to nursing interventions and patient outcomes; the search was limited to studies conducted in healthcare settings.

### *Data Sources*

The investigators explored the subsequent databases: from January 2000 to December 2022, a comprehensive exploration of electronic databases, including Google Scholar, the Cochrane Library, Web of Science Core Collection, PubMed, and Scopus. The search was limited to articles published in the English language. Through this thorough assessment, we found a total of 6 articles directly relevant to our research question, "What is the influence of nursing interventions on patient outcomes across various healthcare settings and patient populations."

### *Inclusion and Exclusion Criteria*

The inclusion criteria involved research that investigated the impact of nursing interventions on patient outcomes, while studies that specifically focused on particular patient populations or clinical settings were excluded. The review incorporated studies that satisfied the following criteria: (1) evaluated the impact of nursing interventions on patient outcomes, (2) used a randomized controlled trial, quasi-experimental, or observational design, (3) included adult patients, and (4) were conducted in healthcare settings. Studies that focused on specific populations or diseases were excluded.

### *Design*

A systematic review methodology was employed in the study to assess the effect of nursing interventions on patient outcomes. The review adhered to the Preferred Reporting Items for Systematic Reviews using a flow diagram of the study to ensure the transparency and thoroughness of the review process.

### *Data Extraction*

The researchers extracted data from the selected studies that met the inclusion criteria. The extracted information comprised study design, sample size, intervention type, measured outcomes, and outcomes achieved.

### *Analysis Methods*

Following a structured process to analyze the studies included in the review, the results of this study were presented following a narrative analysis, as follows: First, study selection: identify relevant studies by conducting a comprehensive search of databases, using specific search terms and inclusion criteria, and screening the search results based on titles, abstracts, and full-text articles to select studies that meet the predetermined eligibility criteria. Second, extract relevant data from the selected studies. It assessed

**Table 1.** Summary of the results of the studies included in the study

Nursing intervention	Patient population	Healthcare setting	Key findings
Patient education	Adults with chronic diseases (e.g., diabetes, hypertension)	Hospital, community clinic	Improved patient knowledge and self-management of chronic diseases
Medication management	Adults with various conditions	Hospital, long-term care	Increased medication adherence and reduced medication-related adverse events
Infection control	Adults with various conditions	Hospital, long-term care	Decreased incidence of healthcare-associated infections
Pain management	Adults with acute or chronic pain	Hospital	Improved pain control and patient satisfaction
Fall prevention	Older adults or adults at risk for falls	Hospital, long-term care	Reduction in falls and fall-related injuries observed in interventions such as alarms and exercise programs
Wound care management	Adults with wounds (e.g., laceration, puncture, burn, and avulsion wound)	Hospital, community clinic, long-term care	Wound care management interventions resulted in reduced wound healing time and lower infection rates

the quality and risk of bias of each included study; findings from the included studies were then aggregated to identify patterns and trends.

## Results

Table 1 and Figure 1 provides a summary of the nursing interventions examined in the systematic review. Patient education interventions targeting adults with chronic diseases improved their knowledge and self-management in hospital and community clinic settings. Medication management interventions increased adherence and reduced adverse events in hospital and long-term care settings. Infection control interventions decreased healthcare-associated infections among adults in hospitals and long-term care facilities. Pain management interventions in hospitals improve pain control and patient satisfaction. Fall prevention interventions in hospitals and long-term care settings reduced falls and fall-related injuries, utilizing strategies like alarms and exercise programs. Wound care management interventions in hospitals, community clinics, and long-term care settings resulted in faster wound healing and lower infection rates for adults with various wound types. These interventions play a crucial role in improving patient outcomes, ensuring patient safety, and enhancing overall healthcare quality.

Table 2 outlines the study attributes, such as publication year, study design, nursing intervention, patient

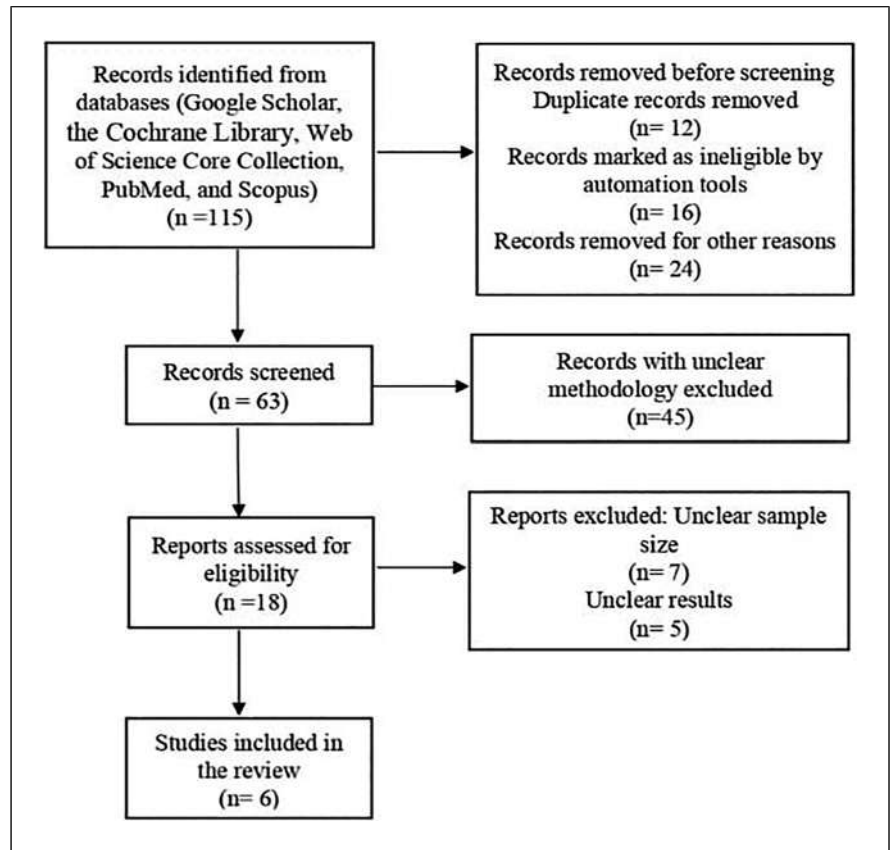
population, and outcome measures, providing a condensed representation of the systematic review's extent. Table 3 facilitates readers in comprehending the extent of the systematic review and detecting patterns in the interventions and studies encompassed. These studies cover various patient populations and nursing interventions, aiming to assess their impact on specific outcome measures related to diabetes management, heart failure, orthopedic surgery, pain management, fall prevention, and wound care.

Table 3 provides a summary of recommendations for nursing practice based on the reviewed interventions. These recommendations underscore the importance of evidence-based nursing practices in patient education, medication management, infection control, pain management, fall prevention, and wound care. By implementing these recommendations, nurses can contribute to improving patient outcomes, enhancing patient safety, and delivering high-quality care.

## Discussion

The review highlights the importance of evidence-based nursing practice and the need for ongoing research to identify best practices for nursing interventions. These studies were executed in diverse clinical environments, comprising hospitals, long-term care facilities, and community settings. The nursing interventions that were examined in the studies included

**Fig. 1.** Flow diagram of the study. The flowchart outlines the sequential procedure for the inclusion and exclusion of studies in this systematic review. In this study, a comprehensive search was conducted across multiple databases, including Google Scholar, the Cochrane Library, Web of Science Core Collection, PubMed, and Scopus. A total of 115 records were initially identified. After removing duplicate records ( $n = 12$ ) and using automation tools to identify ineligible records ( $n = 16$ ), 24 additional records were excluded for various reasons. Subsequently, the remaining 63 records were thoroughly screened. Among them, 45 records were excluded due to having unclear methodology. A further assessment was carried out on the remaining 18 reports for eligibility. Out of these, 7 reports were excluded due to unclear sample sizes, while 5 reports had ambiguous results. Ultimately, the review included a total of 6 studies that met the inclusion criteria.



patient education, medication management, infection control, pain management, fall prevention, and wound care management. The studies reflected that nursing interventions had a significant impact on improving patient outcomes across a range of healthcare settings. The efficacy of nursing interventions is due to the fact that nurses are in direct contact with patients and are able to provide individualized care, nurses are also able to educate patients and provide them with the necessary skills to manage their condition and adhere to treatment plans; additionally, nurses are able to identify potential risks and implement interventions to prevent adverse events.

Patient education interventions were found to be effective in improving patient knowledge and self-management of chronic diseases, such as diabetes and hypertension; regarding medication management interventions, they improved medication adherence and reduced medication-related adverse events. This result is consistent with studies that found that patient education interventions can improve patient knowledge and self-management of chronic diseases [20, 21]. It has been revealed that patient education is a highly effective

nursing intervention in improving patient outcomes; patients' education led to a significant improvement in glycemic control among patients with diabetes. The study reported that patient education improved patient knowledge and understanding of their condition, resulting in improved adherence to treatment plans and better self-management of their condition [22]. In another study by Riegel et al. [23], reported that patient education improved medication adherence among patients with heart failure.

Medication management is another nursing intervention that was found to have a positive impact on patient outcomes. Several studies reported that medication management interventions, such as medication reconciliation and medication reviews, resulted in a reduction in medication errors and adverse drug events. A systematic review by Baughman et al. [24] reported that medication reconciliation interventions led to a significant reduction in medication discrepancies and adverse drug events, and similarly, a study by Blixen et al. [25] reported that medication reviews led to a significant reduction in hospital readmissions among elderly patients.

**Table 2.** Summary of study characteristics

Study	Study design	Patient population	Nursing intervention	Outcome measures
Chen et al. [14] (2021)	Randomized controlled trial	Adults with type 2 diabetes	Empowerment-based intervention	HbA1c levels, psychosocial self-efficacy, diabetes knowledge
Marques et al. [15] (2022)	Systematic review and meta-analysis	Patients with heart failure	Nursing educational intervention with home visits and telephone contact	Hospital readmission, mortality of patients with heart failure
Bai et al. [16] (2021)	Randomized controlled trial	Elderly patients undergoing orthopedic surgery	Operating room nursing intervention	Grade A incision healing rate, length of hospital stays, and patient satisfaction rate
Germossa et al. [17] (2022)	Quasi-experimental	Patients admitted to the four inpatient departments	Nurse-led pain management program	The proportion of patients perceiving staff response within 30 min, overall patient satisfaction with pain management
Ojo and Thiamwong [18] (2022)	Systematic review	Older adults	Nurse-led fall prevention programs	Reduction in fall rates, reduction in fall incidents, changes in patients' behavior
Tegegne et al. [19] (2022)	Hospital-based cross-sectional study design	Nurses working in government hospitals of South Wollo Zone, Ethiopia	Assessment of knowledge and practice of wound care	Knowledge and practice of wound care among nurses

**Table 3.** Summary of recommendations for nursing practice

Nursing intervention	Recommendations
Patient education	Include patient education as a standard component of nursing care for patients with chronic diseases
Medication management	Implement medication reconciliation and monitoring programs to prevent medication errors and adverse events
Infection control	Implement infection control measures based on evidence, such as practicing hand hygiene and adopting isolation protocols
Pain management	Adopt a comprehensive pain management strategy that encompasses both pharmacological and non-pharmacological interventions
Fall prevention	Implement fall prevention programs that include a combination of environmental modifications, exercise programs, and staff education and training
Wound care management	Enhance access to training opportunities, strengthen mentorship and peer support programs, incorporate wound care competencies into nursing curricula, and implement quality improvement initiatives

Infection control interventions, such as hand hygiene and isolation precautions, showed effectiveness in improving patient outcomes. This result is consis-

tent with several of the studies that referred to the implementing infection control measures led to a decline in healthcare-associated infections and

enhanced patient safety [26, 27]. A survey conducted in US hospitals observed a significant decrease in the incidence of healthcare-associated infections among patients in intensive care units following hand hygiene interventions [28]. Likewise, a study by Huis et al. [29] found that implementing isolation protocols resulted in a significant reduction in the transmission of multidrug-resistant organisms among hospitalized patients.

Nursing interventions aimed at pain management were also examined in this systematic review. Several studies reported that pain management interventions, such as the use of non-pharmacological interventions and patient-controlled analgesia, resulted in a reduction in pain intensity and improved patient satisfaction. This finding is similar to the report of a study conducted by Chou et al. [30], which reported that the use of patient-controlled analgesia led to a significant reduction in pain intensity among postoperative patients. There is a study conducted by Wu et al. [31] that reported that non-pharmacological interventions, such as music therapy, led to a significant reduction in pain intensity among patients with cancer.

Regarding fall prevention, nursing interventions aimed at fall prevention were also found to have a positive impact on patient outcomes. Several studies reported that fall prevention interventions, such as the use of bed alarms and exercise programs, resulted in a reduction in falls. This result is supported by the results of a study in which it was stated that the use of bed alarms led to a significant reduction in falls among hospitalized older adults [32].

The study has explored the effectiveness of wound care management interventions and has reported promising outcomes; one key finding is the significant reduction in wound healing time, by employing evidence-based wound care techniques, such as appropriate cleansing, debridement, dressing selection, and wound monitoring, healthcare providers can facilitate faster healing of wounds. This result is supported by Sibbald et al. [33], whose results revealed that prolonged healing time can lead to increased pain, discomfort, and risk of complications.

## Conclusion

Patient education interventions have a positive impact on patient outcomes, including increased knowledge, improved self-management, and enhanced quality of life. Medication management interventions play a crucial role in improving patient outcomes. Implementation of medication reconciliation and monitoring programs can help prevent medication errors, enhance medication

adherence, and reduce adverse drug reactions. Infection control practices significantly contribute to improved patient outcomes. Adherence to evidence-based infection control measures, such as proper hand hygiene and isolation precautions, reduces the incidence of healthcare-associated infections. Effective pain management interventions, encompassing both pharmacological and non-pharmacological approaches, contribute to better outcomes for patients experiencing acute or chronic pain. Implementing a multimodal pain management strategy can lead to better pain control and increased patient satisfaction. Fall prevention programs are essential in reducing the incidence of falls and fall-related injuries, particularly among older adults and individuals at risk.

## Statement of Ethics

An ethics statement is not applicable because this study is based exclusively on published literature.

## Conflict of Interest Statement

The authors have no conflicts of interest to declare.

## Funding Sources

The authors declare that no funds have been received for this study.

## Author Contributions

Ahmed Abdalla Jarelnape and Elwaleed Idris Sagiron designed and implemented the study, and also contributed to searches in databases and reviewed their abstracts. Zeinab Taha Alia and Abdalla Mohamed Osman proofread the manuscript, completed the data collection and data entry, and also contributed to the analysis. Eltayeb Abdelazeem and Hamza Balola reviewed the abstracts, interpretation of findings, and also contributed to drafting and revising the manuscript. Aida Ahmed Fadlala and Bander Albagawi contributed to drafting, reviewed the abstracts, and revising the manuscript. All authors approved the final manuscript.

## Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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