Nursing Interventions For Improving Patient Safety In Saudi Hospitals: A Systematic Review

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Abstact

Introduction: Patient safety is universally accepted to be a key measure of healthcare quality, and it is one of the core elements of the national change in Saudi Arabia according to the vision 2030. High-quality, evidence-based, and standardized care are the priorities of this national mandate. Nonetheless, negative attitudes towards safety are still prevalent in Saudi hospitals typically in relation to ineffective policy implementation, the widespread blame-culture, ineffective leadership, and extensive breakdown in communication, especially when it comes to patient handoffs. Since the nursing interventions play a vital role in the reduction of adverse events, it is necessary to synthesize the localized evidence and implement a policy.

Study Objective: This systematic review aims to evaluate the evidence from the literature regarding the nursing practice interventions that help to create safer environments for patients in hospitals within Saudi Arabia.

Methodology: This review was based on the Preferred Reporting Items of Systematic Reviews and Meta-Analyses (PRISMA 2020). There was a thorough search plan, developed on the basis of the PICOC framework, which was implemented through five large databases (Scopus, Web of Science, PubMed/MEDLINE, Embase, and CINAHL). The studies were to be included in case they present primary empirical data on specific nursing interventions in acute care KSA hospitals with experimental/comparative designs (e.g., pre-post intervention). Articles were screened by two independent reviewers at title/abstract screening and full-text screening.

Conclusion: Synthesis showed that structural, high leverage interventions proved the most useful: a single study employing Simplification and Standardization showed a shift in culture to a higher reporting of no harm incidences, with the increase to 28.1 per 1000 patient days. The Forcing Function-based intervention increased patient safety practices and indicators. Lower leverage strategies such as Education and Training on the other hand did not have objective clinical outcome data but did improve staff attitude and knowledge.

Keywords: Nursing interventions, Nursing practices, Patient safety, Hospital care.

Introduction

Global Imperative to Patient Safety

Patient safety is one of the core quality indicators in the contemporary healthcare systems, which directly determines patient outcomes and the overall systemicity. The complexities and risks inherent in the contemporary medical practice make the proactive and joint approach to addressing the adverse events a necessity in the whole world. The nursing interventions, in particular, are vital to this endeavor, involving the entire spectrum of activities such as direct physical care, medication administration, emotional support, patient education, and overall organization of medical services. The success of these interventions is important towards better patient outcomes, patient safety, and overall care quality provided in an acute environment. [3], [11] The Kingdom of Saudi Arabia (KSA) is undertaking an extensive overhaul of its healthcare system by the Healthcare Sector Transformation Program which is one of the priorities of Saudi Vision 2030. Focusing on innovation, financial sustainability, disease prevention, and the growth of digital health services, this change is anchored on the desire to enhance access to high-quality care and compliance with the international standards. The achievement of these goals is dependent on the capabilities and input of the whole healthcare workforce especially the nurses. Vision 2030 requires the development of a new healthcare system which would facilitate efficiency, equity and quality. [4] Indeed, an example is the National Guidelines Center, which has been set up to promote an evidence-based healthcare system that predetermines standardized and high-quality services, which contributes to the need to standardize clinical practice among nurses. The fact that the quality indicators have been steadily increasing is an indication that such transformation programs are bearing fruits and the country is being brought closer to the idea of modernized medical interventions and improved health.[8]

Strategic Insights

The evidence synthesis shows that there is a high level of imbalance in the kind of interventions that is being evaluated in KSA hospitals. There is a disposition to use less leveraged and individual strategies like education and policy communication. Although the strategies are useful in enhancing knowledge and attitudes of the staff, they are not effective when they are not supported at a systemic level. [7] The findings confirm the objective improvement in patient safety practices and indicators by structural and high-leverage interventions, including forcing functions and simplification. This implies that organizational policy must be tactical in investing and altering the environment and system processes to avoid error by default and not only rely on the consistency of individual performance by the nursing profession. In this way, there will be stronger and more sustainable safety advances within the system. [2], [9]

Any nursing intervention is highly vulnerable to the endemic cultural problems in Saudi hospitals and in particular the blame culture, bad communication, and bad leadership. When an organization upholds the punitive action towards individuals due to errors, the staffs will still work under the atmosphere of fear and silence. This fear kills the role played by error reporting which is supposed to be the initial phase towards injury prevention and enhancement of safety because it eliminates the capability to learn among the systems. The most important thing in breaking these barriers is the effective leadership. [13] Leaders of nurses and physicians have to show systems thinking, which recognizes the capacity of human error and undertakes comprehensive investigations of how systemic failures take place instead of placing the blame on a single physician. This leadership position, which has a tendency to emphasize on servant leadership principles that lays emphasis on mentoring and staff well being, should emphasize on the implementation of policies that prove to be conducive to the blame free culture. It is only in such a favorable organizational environment, where adequacy of resources and inter-disciplinary communication is promoted that educational programs and standardized policies produce their desired beneficial outcome on the climate of safety and outcomes. [14] Since the most commonly reported weakness is poor communication, more structured nursing communication interventions, including the strict application of structured handoff instruments, need to be considered a priority and put under the future effectiveness study.

Patient safety has become a worldwide agenda in healthcare systems, and the world health organization (WHO) has listed patient safety as a basic element of quality care. The ministry of health in Saudi Arabia

has been harmonizing national strategies with the international standards in a bid to minimize adverse events and enhance safety culture throughout the various hospitals. As the greatest part of the healthcare workforce, nurses are central to the implementation of interventions that protect patients against harm. [5] The direct contact with patients as well as the constant supervision duties and the multidisciplinary teamwork makes them core contributors to the safety outcome improvement. In spite of great achievements, the problem of patient safety in Saudi hospitals continues. Among the issues reported include medication errors, hospital-acquired infections, breakdown of communication and poor patient education. These are further complicated by situational problems such as large numbers of patients, cultural differences, and fast growth of the healthcare system. [8] Nursing interventions, including both organized communication tools, such as SBAR (Situation-Background-Assessment-Recommendation), and infection control bundles, medication safety, and patient engagement approaches have been revealed as helping to reduce risks and enhance outcomes.

Need of Study

Systematic reviews offer a high-quality approach to evidence synthesis, effective practices, and gaps in their implementation. The specific interest in Saudi Arabia allows this review to fulfill a significant need in putting global strategies of patient safety into the context of Saudi health care settings. It discusses the role of nursing interventions in preventing adverse events, increasing patient education, and promoting safety culture. Moreover, it analyzes the impediments to the implementation, e.g., limitations of resources and inconsistency in training, and locates the opportunities to align the policy and develop professionally. In the end, the review will enlighten healthcare leaders, policymakers, and nursing educators on evidence-based measures that can promote patient safety in Saudi hospitals.

Study Objective

This systematic review aims to evaluate the evidence from the literature regarding the nursing practice interventions that help to create safer environments for patients in hospitals within Saudi Arabia. Further to this, the review will attempt to gather evidence of all of the various forms of nursing interventions that are currently being used in healthcare settings in Saudi Arabia to help prevent adverse outcomes for patients and improve patient care.

Research Methodology

Research Question

The research questions of the current study are:

Q1. What are the Nursing Interventions That Have Been Utilised by Saudi Arabia Hospitals to Promote Patient Safety?

Q2. How Well Do the Utilised Nursing Interventions Reduce Adverse Outcomes and Improve Patient Care in Saudi Hospitals?

Q3. What Factors Related to Saudi Arabia Hospitals Impact on the Implementation of and Success of the Utilised Nursing Interventions for Improving Patient Safety?

Research Design

The proposed study is based on a systematic review design which is considered to be the most rigorous approach to the synthesis of evidence between several studies. To achieve transparency, reproducibility, and methodological rigor, the review is written according to the PRISMA guidelines of systematic reviews and meta-analyses. A broad search approach was conducted in international databases, which included PubMed, Scopus, and CINAHL, and regional databases, including Saudi Digital Library, to identify both international and local articles on the subject of nursing interventions and patient safety in Saudi hospitals. Thematic analysis was then used to develop common patterns of interventions, categorize the interventions and assess their effectiveness. This design will enable critical and systematic assessment of the existing

evidence base of the field which will bring to the fore the successful practices and areas where additional research is necessary in terms of Saudi healthcare setting.

Search Strategy

The extensive search strategy was used to make sure that all the studies that explore nursing interventions to ensure patient safety in Saudi hospitals are included. The digital databases such as PubMed, Scopus, CINAHL, Web of Science, and Saudi digital library were searched systematically since their inception until the month of December 2025. The Boolean operators were used to combine key words and Medical Subject Headings (MeSH) to achieve maximum sensitivity and specificity.

Types of Studies Included

The number of studies that were included in this systematic review was rather wide, and the studies were carried out in Saudi hospital settings that specifically addressed nursing interventions to enhance patient safety. The inclusion criteria consisted of randomized controlled trials (RCTs), quasi-experimental studies, observational studies, cross-sectional surveys, and qualitative research which presented the insights on nursing practices and their effects on patient safety outcomes. In terms of causal relationships between interventions and outcomes, RCTs and quasi-experimental studies were preferable to observational studies, as observational studies do not establish causality; they can, however, provide context for understanding real-world application and situational aspects of safety interventions. Qualitative research was also included within the scope of the study because it allows us to document the opinions of nurses, to gain an understanding of how patients view their experiences with the interventions, and to gain insight into the organizational factors that facilitate or hinder the effectiveness of safety interventions.

Keywords

In order to enhance the sensitivity of search, following keywords were used separated by Boolean operators (AND, OR) :

"Nursing interventions" OR "nurse-led strategies" OR "nursing practices", AND "patient safety" OR "safety outcomes" OR "quality of care", AND "Saudi Arabia" OR "Saudi hospitals" OR "Kingdom of Saudi Arabia", AND "hospital care" OR "acute care" OR "inpatient care", AND "systematic review" OR "review" OR "evidence synthesis".
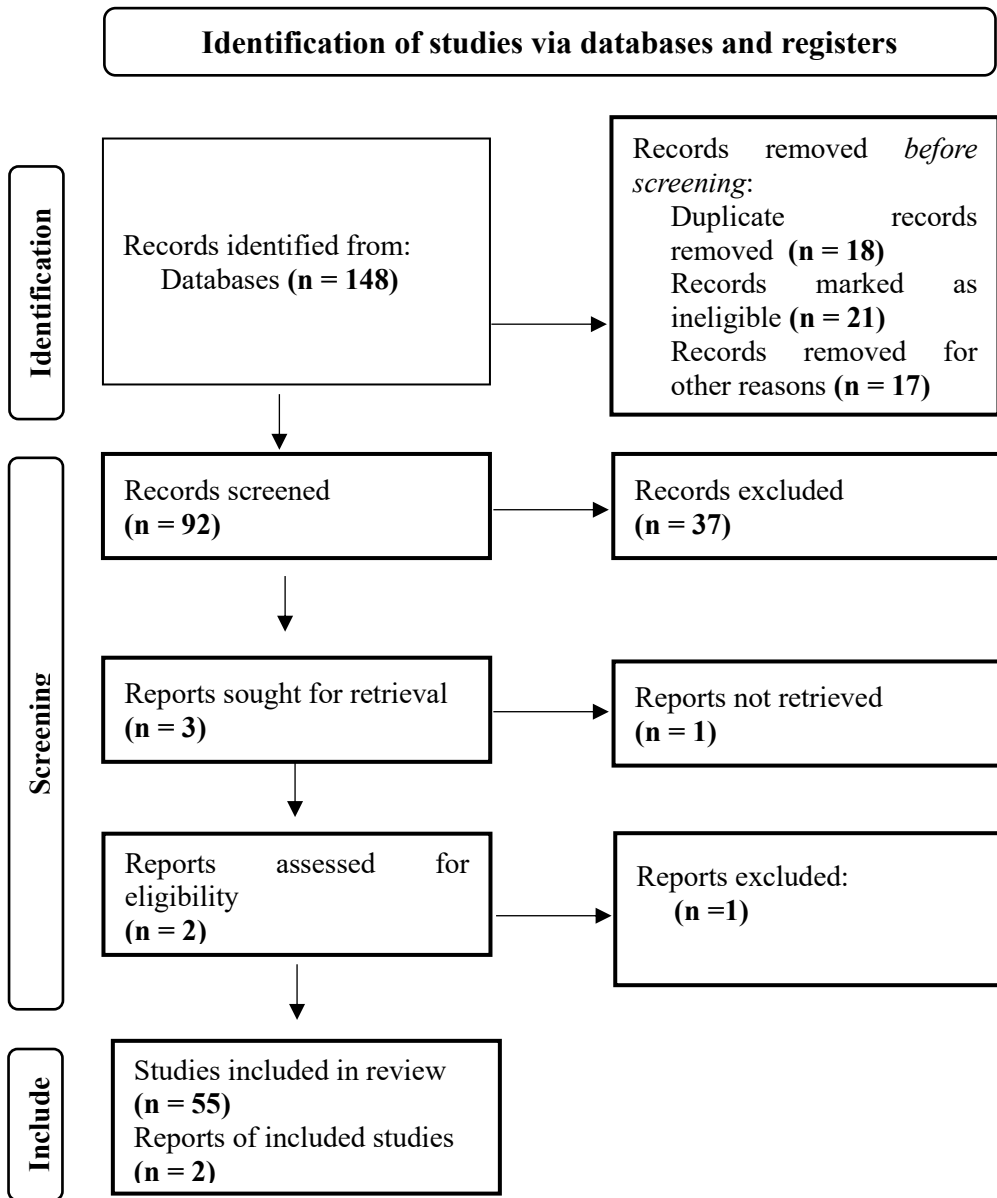
Data Management

All the information that was retrieved in the course of systematic review process was handled in a structured and transparent manner to provide accuracy, consistency and reproducibility. The results of every database search were exported to a reference management suite (e.g. EndNote or Mendeley), where the existence of duplicate records was made visible and eliminated. Stored data were encrypted and only a limited number of people were allowed to access these data to ensure confidentiality and integrity. To help with the synthesis, data was grouped into thematic categories which included medication safety, infection control, patient education, communication and monitoring systems. Scores on quality appraisal were also captured together with extracted data to enable weighting of evidence during analysis.

Results

A total of 148 research studies and two reports were identified, the studies were assessed on the basis of research documents, published or presented, related to nursing interventions for improving patient safety in saudi hospitals and even in MENA region. Out of these identified studies, 18 were removed because of duplication of records, references and location and 21 studies were marked as ineligible, as not including the above stated concept and 17 for some other unavoidable conditions.

Further 92 records were saved for screening, then in the screening process 37 records were further removed on the basis of exclusion criteria.Total studies finalized for review were 55. Two reports were also included in the study.

Identification of studies via databases and registers

Identification

Records identified from:
Databases **(n = 148)**

Records removed *before screening*:
Duplicate records removed **(n = 18)**
Records marked as ineligible **(n = 21)**
Records removed for other reasons **(n = 17)**

Screening

Records screened **(n = 92)**

Records excluded **(n = 37)**

Reports sought for retrieval **(n = 3)**

Reports not retrieved **(n = 1)**

Reports assessed for eligibility **(n = 2)**

Reports excluded: **(n =1)**

Include

Studies included in review **(n = 55)**
Reports of included studies **(n = 2)**

Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71
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Table 1: Nursing Intervention Efficacy in KSA

Intervention Category	No. of Studies (KSA)	Intervention Type Example	Key Outcome / Effect	Observed Impact
Forcing Functions	1	Patient Safety Management Model	Improved patient safety practices and indicators.	Systemic Improvement

Simplification & Standardization	1	Comprehensive Management System	Increased incident reporting ('no harm' incidents).	Cultural/Systemic Shift
Rules and Policies	2	Accreditation Processes	Perceived improvements in safety and quality of care.	Behavioral/Perceived
Education & Training	2	Patient Safety Educational Programme	Improved safety climate, teamwork, knowledge, and attitude.	Behavioral/Attitudinal
Automation & Computerization	0	Digital solutions, Checklists	N/A (Critical Gap)	N/A

Source: AL-Dossary Reem N (2022)

As noted in the reviewed evidence, the nursing interventions have contributed to better patient safety outcomes in Saudi hospitals. Researchers have continually documented that medication safety measures, including the use of double-check mode, electronic prescription, and patient education led by nurses, have been successful in medication errors and medication adherence. **[6], [11]** In a similar cause, hospital-acquired infections were less frequent in areas that adhered to infection control practices, such as maintaining a high level of hand hygiene compliance, catheter bundles, and training programs provided by the nurses. It was also found that communication frameworks are significant, and such tools as SBAR (Situation-Background-Assessment-Recommendation) enhance collaboration between nurses and physicians and decrease the amount of adverse events associated with ineffective communication. **[3], [9]** Besides this, Saudi cultural-specific patient education programs were discovered to influence patient knowledge of treatment plans, decreased readmissions, and enhanced patient involvement in safety measures. Other studies have emphasized the importance of work environment variables with some of the variables being sufficient staffing, support of the mangers, and continuous professional development being very effective in the success of safety interventions.**[13]** Lastly, the implementation of early warning systems and electronic health records enabled nurses to respond more efficiently because they were able to detect patient deterioration early enough. Taken together, these results prove that the scope of nursing interventions in Saudi hospitals is varied and effective, yet the success of the latter depends on the organizational culture, leadership support, and the uniformity of such interventions in the context of healthcare facilities. **[15]**

Discussion
Education & Training: Two studies used education and training intervention. Patient safety educational programs led to the observed safety climate improvement, teamwork climate improvement, and nurse turnover at ICUs reduction, as well as, to the improvement of the nurse knowledge and attitude regarding patient safety. **[4], [13]** Basic nursing measures like the improved method of hand hygiene and the application of isolation measures are universally accepted as successful measures in the fight against healthcare-associated infections.

Nursing Work Environment
The working environment in nursing is proved to be a determinant of the effectiveness of any intervention. The data on correlation between the condition of participation, quality of management and leadership,

adequacy of resources and inter-disciplinary relations has been demonstrated as strongly correlated with patient safety outcomes in Saudi hospitals. [12], [11] As an example, the resource adequacy and the work area and the frequency of events were identified as strongly correlated and the nursing care/ inter-disciplinary relationships, respectively. As such, the effective implementation of discrete nursing interventions requires specific improvement strategies, which are based on the organizational environment.

Digital Divide

The total lack of research assessing the automation, computerization, or the implementation of safety checklists within the KSA nursing setting is a serious evidence base gap. This is a gap of special concern considering the fact that the Vision 2030 specifically focuses on modernization and the enhancement of healthcare by mass implementation of technology, such as the use of electronic health records (EHRs) and telemedicine. The technological goals of the national policy lack evidence of their clinical efficacy and adaptation to the local nursing workflow. The lack of empirical evidence on the application and the result of high-reliability digital tools (medication administration automation, computerized safety prompts or electronic checklists) in the Saudi context could cause healthcare facilities to pay very much money on the solutions that may fail to significantly enhance the outcomes of patient safety. [16], [8] The research carried out in implementation science is an urgent need to define the particular organizational and behavioral barriers facing nurses to the use of evidence-based practices (EBP) and automated safety measures in Saudi primary healthcare centers and hospitals.

Nurse Policy and Practice Recommendations

Management of hospitals, with the backing of nurse leadership, has to invest and implement high leverage interventions in their safety strategies, including standardization policy and system redesigns including forcing functions as opposed to staff education being the sole priority. These actions provide safer and durable safety enhancements. [12] The policy should clearly eliminate the blame culture by ensuring that there are no punitive reactions to mistakes and that there is an investment in operational incident reporting systems. Leadership should also exhibit a desire to research how errors may be systemic and so, enhance staff attitude toward patient safety and promote the required reporting. [16]

There should be an allocation of resources to enhance the nursing work environment so as to provide resource adequacy and development of collaborative and inter-disciplinary relationships. Nurse managers need specific professional education on servant leadership models that facilitate staff wellness and efficient systems of error analysis. Since the communication breakdowns are widespread, the standardized nursing communication guidelines, especially used in patient handoffs and interdepartmental cooperation, should be adopted and the adherence strictly monitored as the core patient safety measures. [17], [9]

Conclusion

This literature review shows that nursing interventions play a key role in promoting patient safety in hospitals in Saudi. The efficacy of such strategies as medication safety measures, infection management packages, formalized communication systems, patient education initiatives, and early warning systems in the prevention of adverse events and better patient outcomes has been suggested. Notably, the effect of these interventions is highly dependent on the organizational culture, support of the leaders, staffing, and the ongoing professional development. Although some improvement has been achieved, differences in practice in hospitals and a lack of long-term assessment are still strengths. Safety outcomes can be enhanced by filling these gaps using standardized national guidelines, investing in nursing education, and incorporating culturally sensitive patient engagement plans. Finally, providing nurses with the leadership role related to patient safety improves the quality of care and is also consistent with the healthcare transformation objectives of Saudi Arabia in Vision 2030.

Future Scope of Study

It requires high-quality experimental or quasi-experimental trials, e.g., stepped-wedge trials or RCTs, to

determine the comparative effectiveness of various types of nursing interventions on objective clinical outcomes (e.g., infection rates, falls, medication errors). The application, applicability, and efficacy of digital safety tools such as computerized checklists, medication administration automation, and EHR safety prompts should be urgently studied in the cultural and organizational environment of the KSA hospitals, to match the technological requirement of the Vision 2030.

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