

A SYSTEMATIC REVIEW EXAMINING THE CORRELATION BETWEEN NURSE STAFFING RATIOS AND QUALITY OF CARE OR PATIENT SAFETY OUTCOMES

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Abstract

In healthcare settings in the Kingdom of Saudi Arabia (KSA), this systematic review examines the relationship between nurse labor ratios and patient safety or quality of care outcomes. Despite the critical role that adequate nurse staffing plays in assuring patient safety and care quality, there is a substantial disparity in the comprehension of this relationship in the context of KSA. Five studies that satisfied the established criteria were included after a thorough survey of peer-reviewed literature from 2021 to 2024 was conducted across multiple databases. The results indicate a robust correlation between improved nurse staffing levels and improved patient outcomes, emphasizing that low nurse-to-patient ratios are associated with increased rates of adverse events, including patient accidents and pressure injuries. Furthermore, the review suggests that patient safety is substantially influenced by factors such as professional competence and the nursing work environment. The imperative necessity for evidence-based policy interventions to enhance the quality of healthcare in KSA and optimize nurse staffing ratios is emphasized by the evidence presented. In order to improve comprehension and inform policy initiatives, future research should concentrate on further investigating these relationships in a variety of healthcare contexts.

Keywords: Examining Correlation, Nurse Staffing, Ratios and Quality Care, Patient Safety Outcomes.

Introduction

The relationship between the quality of patient care, nursing workloads, skill balance, and nurse personnel has been the subject of extensive research for more than two decades (Twigg et al., 2021). Nurses benefit from improved nurse staffing as well; they are less likely to intend to abandon their employer, report less job dissatisfaction, and experience less fatigue in higher-staffed hospitals (Lasater et al., 2021).

Modern societies require health care that prioritizes safety and quality, irrespective of their economic or geographic location (Witczak et al., 2021). Numerous studies have illustrated the role of registered nurses in ensuring the safety of patient care (Dall'Ora et al., 2022). Safety culture is the attitude and



behavior of individuals toward appropriate and inappropriate actions, as well as the management role in the rewards and consequences for improved patient safety, as well as their values and beliefs regarding what is essential in healthcare settings (Alanazi et al., 2023).

Quality care is a top priority in all health care facilities, as it is essential for nursing care (Tenorio et al., 2021). Nevertheless, the nursing shortage has been a human resource concern, and the retention of nurse personnel has been identified as a significant challenge, there is a growing body of evidence that suggests that a low nurse-to-patient ratio may result in suboptimal patient outcomes, this is a concern that requires further investigation (Tenorio et al., 2021).

In recent years, the International Council of Nurses, International Hospital Federation, and other international health professional associations have prioritized a Positive Practice Environments (PPE) campaign to address the health, safety, and personal well-being of health professionals, including nurses, and to prevent the exacerbation of nursing shortages (Wynendaele et al., 2019).

Saudi Arabia is making significant investments in the improvement of patient safety (Algethami et al., 2024). Saudi Arabian healthcare is preoccupied with the critical issue of nurse employment and its influence on the quality of patient treatment. In this context, a comprehensive comprehension of the relationships between nurse-to-patient ratios, nurse engagement, and care quality is, however, lacking (Alharthi et al., 2023).

The rationale for this research is the increasing body of evidence that supports the critical relationship between patient outcomes in healthcare settings and nurse staffing levels (Alotaibi et al., 2023). It is imperative to understand the specific intricacies of the Saudi Arabian healthcare context as evidence of the impact of personnel on patient safety, quality of care, and overall satisfaction continues to accumulate (Alotaibi et al., 2023).

There is a substantial lacuna in understanding the specific ways in which these relationships manifest within the Saudi Arabian healthcare system, despite the increasing body of evidence linking nurse staffing levels to patient outcomes. This systematic review aimed to investigate the relationship between the quality of care or patient safety outcomes and nurse labor ratios in Saudi Arabian healthcare settings.

Methods

Introduction

The objective of this systematic review was to compile the most recent research on the relationship between nurse staffing ratios and patient safety or quality of care outcomes. A thorough search strategy was implemented to identify pertinent studies, which was subsequently followed by a structured selection process and data extraction to guarantee a thorough analysis of the results.

Search Strategy

In order to identify peer-reviewed articles published from 2021 to 2024, a comprehensive literature search was conducted across multiple databases, including PubMed, Scopus, Web of Science, and Google Scholar. The search was conducted using a combination of keywords and Medical Subject Headings (MeSH) terms, including "Saudi Arabia," "patient safety," "quality of care," and "nurse staffing ratios." The search results were refined using Boolean operators (AND, OR), and language restrictions were implemented to exclude publications that were not in Arabic or English. Furthermore,

in order to identify additional papers that satisfied the inclusion criteria, the reference lists of pertinent studies were examined.

Inclusion Criteria

In order to guarantee quality and relevance, this systematic review comprised studies that satisfied specific criteria. The inclusion criteria included studies that examined the relationship between nurse labor ratios and their effect on patient safety outcomes or quality of care in Saudi Arabian healthcare settings. Quantitative, qualitative, or mixed-methods research designs that collected primary data through surveys, interviews, or observational studies were extended eligibility, and only peer-reviewed articles published between 2021 and 2024 were considered.

Exclusion Criteria

Exclusion Criteria Studies were excluded if they were conducted outside of hospital settings or focused on non-nursing personnel. Articles that did not explicitly address the correlation between nurse staffing ratios and either quality of care or patient safety outcomes were excluded. Furthermore, editorials, opinion articles, and reviews that lacked original research data were excluded. The review also excluded unpublished academic works, such as theses and dissertations. This extensive set of criteria guaranteed that the systematic review explicitly examined the correlation between patient outcomes and nurse staffing levels in Saudi Arabian healthcare settings.

Process of Selection

In 2024, the review search produced 150 results. Eighty articles remained after the removal of duplicates. Fifty studies were excluded due to their failure to satisfy the inclusion criteria after the titles and abstracts were reviewed. As a result, 30 studies were evaluated for eligibility through full-text analysis; however, 25 were excluded as a result of inadequate reporting of the original data. In the end, this systematic review comprised 5 investigations (refer to Table 1 and Figure 1).

Data Extraction

All titles, abstracts, and data were subjected to the defined inclusion and exclusion criteria in a meticulous review process. The four phases of the systematic review methodology were depicted in a PRISMA flowchart. The systematic review procedure is depicted in Figure 1. The data from the 5 studies that were included in the analysis were compiled and presented in Table 1. The relationship between nurse staffing ratios and quality of care or patient safety outcomes was comprehensively examined by extracting and evaluating summarized information on the authorship, study design, results, and conclusions.

Results

This chapter summarizes the results of the systematic review that investigated the relationship between nurse staffing ratios and patient safety or quality of care outcomes in the Kingdom of Saudi Arabia (KSA). The objective of the review was to consolidate the evidence from a variety of studies and offer a thorough comprehension of this critical relationship in the healthcare sector. Particularly, the evaluation concentrated on the correlation between patient outcomes and nurse personnel levels, as well as the influence of nurse professional competence and nursing work environment factors on patient safety.

Primary Research Questions

- What is the relationship between patient safety outcomes in KSA and nurse staffing ratios?

- What is the impact of nursing work environment factors on patient safety?
- What is the correlation between adverse events and nurse professional competence?

This chapter presents the results of the systematic review in order to address these research questions. The results include an overview of the included studies, the quality of the evidence, and the main findings relevant to nurse professional competence, nursing work environment, and nurse staffing ratios.

Table (1): Summary of the related studies

Author	Aim	Study Design	Results
(Halabi et al., 2021).	To assess nurses' self-reported professional competence and explore their experiences regarding the quality of nursing care and patient safety in the Kingdom of Saudi Arabia.	Cross-sectional study	The quality of nursing care, patient safety, nurses' characteristics, and workplace environments were all found to have significant relationships with self-reported professional competence.
(Al-Dossary, 2022).	To investigate the relationship between nurse staffing, workload, and patient safety in Saudi Arabian hospitals.	Retrospective study	Resource adequacy and work area ($r = 0.763$, $p < 0.01$), participation in management and leadership with work area ($r = 0.712$, $p < 0.01$), and nursing care with interdisciplinary relationships and frequency of safety events ($r = 0.701$, $p < 0.01$) were all found to have significant correlations.
(Alotaibi et al., 2023).	To investigate the influence of nurse staffing levels on patient outcomes within the distinctive organizational, cultural, and policy frameworks of Saudi Arabia.	A systematic review	A total of 2368 records were identified through the database search, and the systematic review included 11 studies that met the specified criteria. The findings indicated that in Saudi Arabia, it is essential to maintain adequate nurse employment levels in order to improve patient outcomes.
(Alenazi et al., 2023)	To examine the relationship between nurse staffing levels and patient outcome indicators in a Saudi hospital setting.	Correlational study	Significant inverse correlations between nurse staffing levels and patient outcomes were observed, indicating improved patient safety with higher nurse-patient ratios.
(Alrasheedday et al., 2024).	To evaluate the perceptions of patient safety culture (PSC) among nurses and its	A cross-sectional study	Positive perceptions were observed by nurses in the areas of 'teamwork within units' (76.86%) and 'frequency of

	correlation with adverse events in Hail City, Saudi Arabia.		events reported' (77.87%), while negative perceptions were observed in critical areas such as 'handoffs and transitions' (18.75%) and staffing' (20.90%). PSC perceptions were found to be significantly associated with diminished adverse events, notably in the reporting of patient falls and pressure ulcers among nurses with higher PSC scores.
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Discussion

In the healthcare sector, including the Kingdom of Saudi Arabia (KSA), the correlation between nurse labor ratios and quality of care or patient safety outcomes is a critical focus. Ultimately, this discussion highlights both strengths and areas for improvement by synthesizing findings from numerous studies that investigate the impact of the nursing work environment, professional competence, and various aspects of nursing on patient outcomes.

Professional Competence of Nurses

The professional competence of registered nurses is closely linked to the clinical areas of their work and the specific responsibilities they assume in patient care, as revealed by the findings of Halabi et al. (2021). This commences the systematic review. The study emphasizes the importance of continuous professional development, particularly as the Kingdom of Saudi Arabia transitions to a self-sufficient national nursing workforce. The KSA context is particularly pertinent to the emphasis on culturally congruent healthcare, as the healthcare system is evolving to better meet the requirements of its diverse population. This underscores a critical correlation between nurse competence and staffing ratios; as nurses enhance their competencies, they may be better equipped to manage increased patient burdens, indicating a synergistic relationship between professional development and sufficient nurse staffing.

Patient Safety and the Nursing Work Environment

Al-Dossary (2022) offers evidence that a positive work environment significantly improves patient safety outcomes by analyzing the nursing work environment. The research identified a number of work environment factors that are associated with enhanced patient safety, such as resource adequacy, management participation, and inter-disciplinary relationships. The results were consistent with those of Halabi et al. (2021) in their assessment of the significance of professional competence, as a supportive work environment can facilitate the development and application of these competencies. In contrast, insufficient personnel levels can result in fatigue and decreased job satisfaction, which can ultimately compromise patient care.

The Relationship Between Patient Outcomes and Staffing Levels

Furthermore, Alanazi et al. (2023) exhibited a substantial inverse relationship between nurse staffing levels and a variety of adverse patient outcomes, including pressure injuries and accidents. This study

reinforces prior research by demonstrating that increased patient satisfaction and fewer adverse events are linked to higher nurse-patient ratios. The statistical correlations presented in this study corroborate the existing evidence that establishes a correlation between adequate staffing and enhanced patient safety and care quality. Alanazi et al. provide clear evidence for policy initiatives aimed at guaranteeing minimum staffing requirements, in contrast to the findings of Halabi et al. (2021) and Al-Dossary et al. (2022), which concentrate on competence and work environment. They explicitly quantify the impact of staffing levels on safety outcomes.

Suggestions for Enhancement

The necessity for systematic modifications that are grounded in empirical evidence is underscored by both Alotaibi et al. (2023) and Alrasheeday et al. (2024). Alotaibi et al. (2023) underscore the importance of adequate staffing levels and advocate for evidence-based policy initiatives to improve nurse staffing ratios. Furthermore, they recognize the constraints of observational data, which may restrict its generalizability in a variety of healthcare environments. This understanding necessitates a more nuanced comprehension of the ways in which nurse employment affects patient outcomes, taking into account the cultural and demographic factors that are prevalent in KSA.

Alrasheeday et al. (2024) further contribute to this discourse by concentrating on the perceptions of patient safety culture (PSC) among nurses, thereby identifying strengths (e.g., collaboration) and weaknesses (e.g., perceptions of handoffs and transitions) within the current system. The substantial correlation between nurse characteristics (i.e., nationality, experience, and current position) and PSC dimensions implies that interventions that are specifically designed to improve patient outcomes could be developed to improve safety culture. The evidence from this study suggests that positive perceptions of staffing and collaboration are correlated with a reduction in adverse events, which supports the argument made by Alanazi et al. regarding the significance of maintaining optimal staffing levels.

Contrasts and Similarities

Several similarities are observed when the results of these studies are compared. Initially, there is a universal consensus regarding the essential importance of increasing the number of nurses in order to improve patient safety outcomes. The evidence conclusively indicates that an urgent need for policy interventions exists, whether through improved professional competence (Halabi et al., 2021), a supportive nurse work environment (Al-Dossary, 2022), or direct personnel correlations (Alanazi et al., 2023).

Additionally, each study indirectly reinforces the primary financial and logical rationale for personnel improvements: the moral obligation to deliver safe and effective patient care. Nevertheless, it is crucial to acknowledge the constraints identified in these studies, particularly in terms of the dependence on observational data and the generalizability of the findings. In order to offer a thorough comprehension of these relationships, it is imperative to conduct longitudinal studies that incorporate a variety of patient demographics and healthcare settings.

Conclusion

In summary, the corpus of research that encompasses a variety of nursing-related topics in KSA emphasizes the urgent necessity of improved nurse personnel ratios, professional competency, and a supportive work environment to guarantee the quality of care and the safety of patients. The results



support the implementation of evidence-based policies that are designed to improve the healthcare work environment, nurture competence, and optimize nurse employment levels as a unified strategy to improve patient outcomes. Future research should continue to investigate these interconnections in order to facilitate the ongoing enhancement of the healthcare system in KSA, in light of the implications of these studies.

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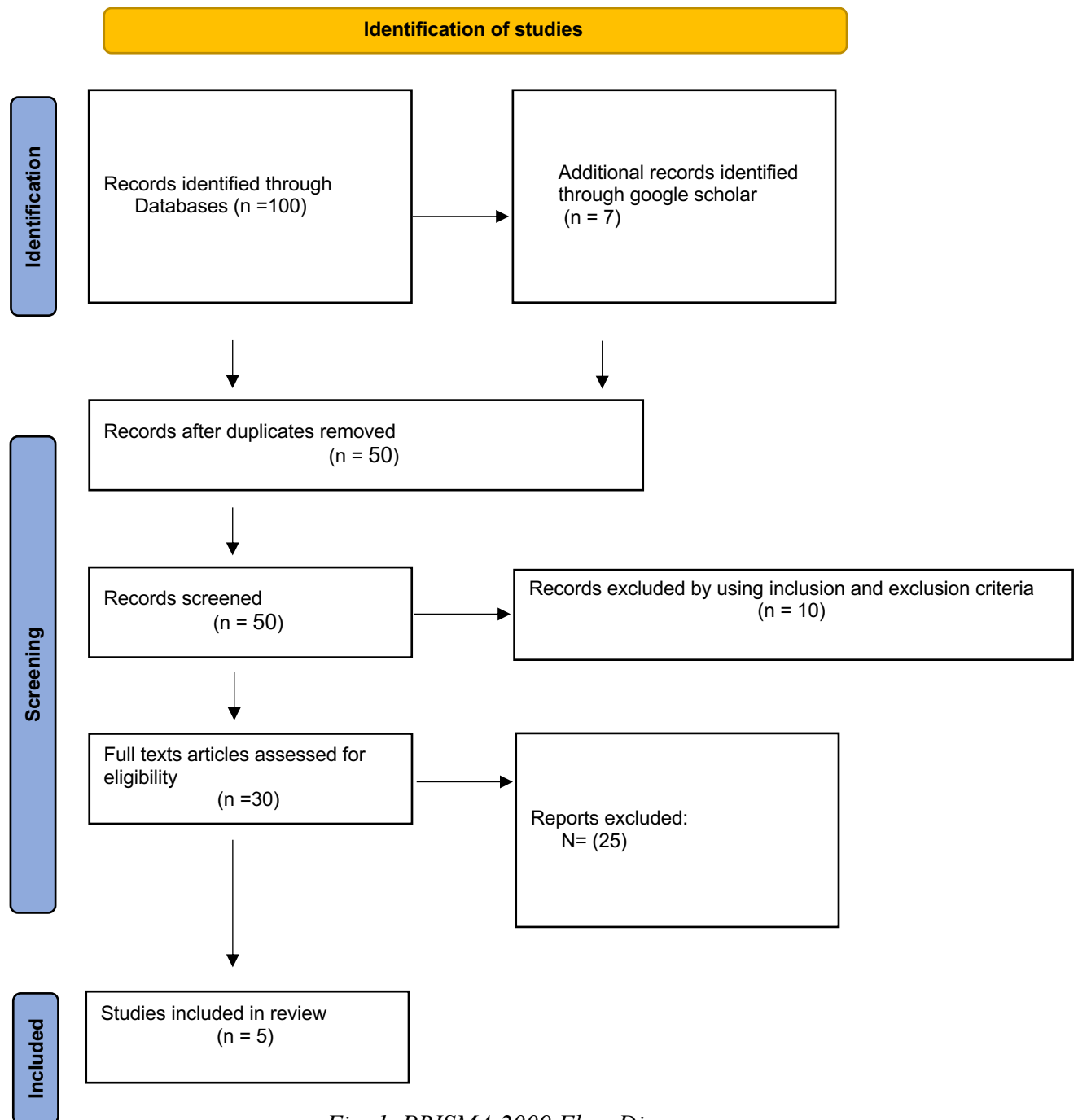


Fig. 1. PRISMA 2009 Flow Diagram