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Influence of Nursing Work Environment on Patient Safety: A Systematic Review

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ABSTRACT

Patient safety is considered an indicator of the quality of health care services so it has a higher priority for the healthcare system worldwide. The work environment, and specifically the environment of nurses, is indeed an important variable related to patient safety. Therefore, this review aims to identify the influence of nursing work environment on patient safety. An in-depth review of quantitative studies that includes data on the relevance to the relationship between nursing work environments and patient safety, and had been published between 2018 and 2024, and focus on hospital or clinical settings was conducted. The study followed the guideline for Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA). Using the keywords: "Work Environment," "nurse." and "Patient Safety" and with the help of Boolean operators, "AND" and "OR" the online databases, namely PubMed, Scopus, Google Scholar, Web of Science, and Science Direct were searched. Articles published from 2018 to 2024 were retrieved. After the quality appraisal, the required data were extracted and analyzed. A narrative synthesis of the findings is conducted and presented in a table. A total of 591 articles were retrieved from the initial search and managed using Endnote software. Out of 591 articles screened, 19 articles were reviewed for eligibility yielding to 11 articles included in this study. More studies are needed in all regions using more robust designs.

KEYWORDS: Nurse, patient safety, work environment.

INTRODUCTION

Nurses are the frontline risk managers who are caring for patients 24 hours per day, so investigating and analyzing their work environment and its effect on patient safety are important to avoid medical errors and improve patient safety (Forbes & Arrieta, 2024).

Staff nurses play an integral role in patient safety as a committed professional assuming both clinical and administrative role in their departments (Febriansyah, et al., 2020). A growing body of evidence indicated that the rate of medical errors and adverse events are associated with the perception of healthcare professionals towards safety (Melnyk, et al., 2021).

Patient safety is described as the cornerstone of high-quality health care. Worldwide, safety in health care has received greater attention since the late 1990s.The Rapid change in health care has produced extra attention to safety which is essential to efficient and competent delivery of quality care. Safety is a state or condition resulting from modification of human behavior or designing of physical environment to reduce risks, thereby reducing the potentiality of accidents (Al-Worafi, 2023).

Patient safety is a global concern affecting different countries at all levels of development. Also, it's reported that patient safety is one of the most important elements of health care today. Patient safety is categorized as one of the six national priorities according to the National Priority Partnership, with specific focus on reduction of mortality rates, serious adverse events, and health care associated infections (Agbar, et al., 2023).

Working conditions are viewed either as resources that improve or impede work quality. Working conditions could negatively affect patient safety, which leads to poor patient outcomes (Jakobsson, et al., 2023). Also, the quality of work, affects patient safety where working conditions has

characterized as factors that can either improve work quality or impedes work quality. Working condition was typed into five categories including: workforce staffing, workflow design, personal/social issues, physical environment, and organizational factors (Lee & Jang, 2023). The safety culture of a healthcare organization is a product of individual or group values, attitudes, perceptions, and behavior that determine their commitment (Carvalho, et al., 2023). According to World Health Organization (2021) encouraging health care working environments in which health care professionals have a good patient safety perception is an important in promoting patient safety practice and improve patient safety.

According to Wazqar & Attallah, (2024), Patient safety problems in hospital were blamed on nursing staff while ignoring many other factors that can greatly contribute to these problems. These factors as working conditions which consider the resources that either improve or impede work quality

To date, there is no existing systematic review conducted in Saudi Arabia to uncover the influence of nursing work environment on patient safety. To fill the literature gap, this review was conducted to explore and synthesize the nursing work environments that influence patient safety in a Saudi Arabian context.

MATERIALS AND METHODS

A systematic review methodology was used to establish and synthesis relevant empirical evidence regarding the influence of nursing work environment on patient safety. The study was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) guidelines

Research Question:

Based on the PICO framework, the research question guiding the review was developed as follows: What is the influence of nursing work environment on patient safety?

Search Strategy

Relevant studies were identified through electronic searches of PubMed, Scopus, Google Scholar, Web of Science, and Science Direct. The snowballing method of searching the bibliographies of retrieved references was applied to identify relevant articles.

Key concepts were nursing work environment and patient safety and relevant key terms including "nurses", "nursing staff", "work", "environment", "working conditions", "patient outcomes", "safety" was used. Boolean operators "AND" and "OR" were used to narrow or broaden search results. Articles were included if they were the reports of original researches, were in English, included data on the relevance to the relationship between nursing work environments and patient safety, and had been published between 2018 and 2024, and focus on hospital or clinical settings. Studies that were non-peer-reviewed, irrelevant to the topic, or conducted in non-hospital settings were excluded.

Study selection

After retrieving the results, duplicates were removed using reference management software (EndNote), and the studies were screened for relevance based on their titles and abstracts. Full-text articles were then assessed to ensure they met the inclusion criteria. Citation searching and grey literature searching further supplemented the identified studies, helping to minimize publication bias.

Data extraction

Extraction of data from the reviewed studies was done using an extraction table. Key study characteristics were extracted from eligible articles included; author, publication year, country, purpose of the study, study design, sample size, methods of data collection and key results.

Quality Appraisal

The quality of the included studies was assessed using the Critical Appraisal Checklists (CASP, 2024). Each paper is scored according to one point for each "Yes" response and zero points for each "No" or "Unclear" response (See Table 1).

Table 1: Critical Appraisal of Studies

Study		Critical Appraisal Assessment									
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	Ibrahim & Abohabieb, (2020),	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Membrillo et al.(2023),	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

3	AlRashidi & Al Harbi, (2024)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Lucas et al.(2023)	Yes	Yes	UN	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Moisoglou et al. (2020)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

The response "Not Applicable" (N/A) was excluded from the total score. The total score was summed up, converted into percentage and categorized as follows; ≥80% represents high quality, 60–79% represents moderate quality and <60% represents low quality.

JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data

		Yes	No	Unclear	Not Applicable
1.	Was the sample representative of the target population?	☐	☐	☐	☐
2.	Were study participants recruited in an appropriate way?	☐	☐	☐	☐
3.	Was the sample size adequate?	☐	☐	☐	☐
4.	Were the study subjects and the setting described in detail?	☐	☐	☐	☐
5.	Was the data analysis conducted with sufficient coverage of the identified sample?	☐	☐	☐	☐
6.	Were objective, standard criteria used for the measurement of the condition?	☐	☐	☐	☐
7.	Was the condition measured reliably?	☐	☐	☐	☐
8.	Was there appropriate statistical analysis?	☐	☐	☐	☐
9.	Are all important confounding factors and subgroups differences identified and accounted for?	☐	☐	☐	☐
10.	Were subpopulations identified using objective criteria?	☐	☐	☐	☐

Data synthesis

The findings of the studies were synthesized narratively to carefully examine the relationship between studies. The characteristics of the study were tabulated and rechecked prior to data synthesis.

Tabulation is preferred to avoid lengthy text description and facilitate ease in synthesis. Data studies were compared in which similarities, differences, and relationships were evaluated. Similar outcomes were grouped together and categorized into themes. Meta-analysis is not performed due to the heterogeneity of the study population design, and results.

RESULTS

Using the keywords and search strategy developed, a total of 591 studies were exported to the EndNote software (v. X7).

Duplicates (268) were excluded. Screening of abstracts and Titles was conducted on 323 studies and further 287 records excluded using the inclusion and exclusion criteria. A total of 36 studies were sought for retrieval and 17 studies were not retrieved due to unavailability of full-text. Full text assessment included 19 studies. From these, 8 studies were excluded after the assessment and 11 studies included in the review (see Figure 1).

Identification of studies via databases and registers

- Records identified from Databases (n =591) → Records removed *before screening*: Duplicate records removed (n = 268)
- Records screened (n = 323) → Records excluded (n = 287)
- Reports sought for retrieval (n = 36) → Reports not retrieved (n = 17)
- Reports assessed for eligibility (n = 19) → Reports excluded (n= 8): Reason: Nurses and physicians (n = 5) Reason: language (n = 2)
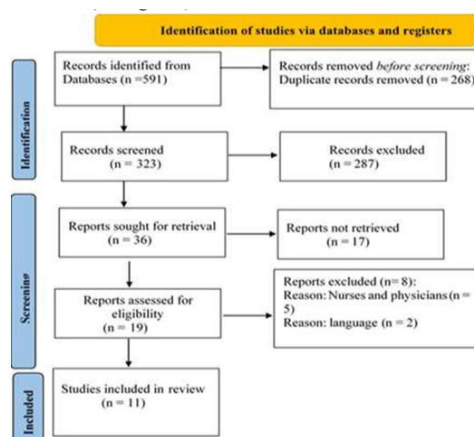- Studies included in review (n = 11)

Figure 1: PRISMA flow diagram

Study Characteristics. In this review 11 studies are included and 4,963 nurses participated in these studies Table 2 includes all 11 records with their characteristics Among the included studies, 8 studies were conducted using a cross-sectional design, two were correlational studies, and one was a qualitative design. Studies were conducted across all regions [Saudi Arabia, Egypt, Peru, Portugal, Greece, South Korea, Indonesia, Pakistan and Poland]. The studies were selected regardless of the unit of specialty.

Table 2: A summary of the characteristics and the quality indicators of the included studies

No	Author & Publication year	Country	Purpose of the study	Study design	Sample Size	Key results
1	Ibrahim & Abohabieb, (2020),	Egypt	To explore the relationships between the work environment, patient safety culture, and missed nursing care among staff nurses.	Correlational design	136 nurses	Work environment and patient safety culture correlated negatively with missed nursing care among staff nurses. There was a positive relationship between work environment, and patient safety culture among staff nurses
2	Membrillo et al.(2023),	Peru	To identify the relationship between nursing practice environments and safety perceptions with patient safety culture (PSC) during COVID-19.	Cross-sectional study	211 nurses	To promote a safe work culture, health institutions should foster leadership that prioritizes safety, strengthens managers' abilities, encourages interprofessional collaboration, and considers nurses' feedback for constant improvement.
3	AlRashidi & Al Harbi, (2024)	Saudi Arabia	To identify work-related factors that influence nursing transparency and patient safety in a hospital setting.	Correlational Design	260 nurses	The study showed that there was a positive association between overall quality of the nursing work environment and the culture of openness in reporting adverse events
4	Lucas et al.(2023)	Portugal	To analyze the relationship between nursing environment and patient safety, and safety culture in Primary Health Care in Portugal.	Cross-sectional	1059 nurses	The quality of the nursing practice environments is associated to better quality and safety of care. Thus, improving the nursing wok environments in healthcare organizations is a low-cost organizational strategy to achieve greater patients and nurses' outcomes, improving the quality of nursing care to patients in the Primary Health Care units.
5	Moisoglou et al. (2020)	Greece	To assess the work environment of the nurses and investigate the relation between the work environment and Selected patients' safety indicators	A cross-sectional design	432 nurses	The study revealed that nurses work in a non- favorable work environment. Hospital and nurse managers have to work together for the improvement of nurses' work environment, as it is a prerequisite for the provision of quality and safety patient care
6	Kim et al.(2018)	South Korea	To explore the influence of nurse work environment and patient safety in South Korea.	A cross-sectional design	186 nurses	This study has significance as it suggested that missed nursing care is affected by work environment factors within unit. This means that missed nursing care is a unit outcome affected by nurse work environment factors and patient safety culture. Therefore, missed nursing care can be managed through the implementation of interventions that promote a positive nursing work environment and patient safety culture.
7	Pramesona et al.(2023)	Indonesia	To investigate the reasons for low patient safety incident reporting among Indonesian nurses	Qualitative study	15 Nurses	Seven themes emerged (1) Understanding incident reporting; (2) The culture; (3) Consequences of reporting; (4) Socialization and training; (5) Facilities; (6) Feedback; and (7) Rewards and Punishments.
8	Faridah et al.(2021)	Indonesia	To determine the correlation between the hospital work environment, nurses' characteristics, and patient safety.	Cross -sectional study	123 nurses	The results showed a significant relationship between hospital work environment and nurses' characteristics (education level, length of service, and training concerning patient safety). Findings indicate that the hospital work environment and nurses' characteristics are related to patient safety.
9	Al-Dossary, (2022),	Saudi Arabia	To Investigate the impact of the nursing work environment on patients' safety in Saudi Arabian hospitals.	Cross -sectional study	357 nurses	The nursing work environment factors, especially participation, management and leadership, nursing care, inter-disciplinary relationships, and resource adequacy have to be improved in order to improve the patients' safety.
10	Malinowska-Lipień et al.(2021)	Poland	To capture nurses' opinions about patients' safety and discern relationships with work environment characteristics.	Cross -sectional Study	1825 nurses	Work environment factors such as proper staffing, good cooperation with doctors, support from the management, as well as professional independence is significantly related to nurses' assessment of patients' safety.

11	Mihdawi et al.(2020),	Pakistan	To examine the relationship between patient safety practices and the nursing work environment.	Cross-sectional study	350 nurses	Nursing indicators, including optimal staffing, resources, communication, and participation in quality improvement activities significantly predicted increased patient safety.

Table 3 shows the detailed quality assessment for each study. The risk of bias of each study was assessed using the JBI Critical Appraisal Checklist version 2017.

DISCUSSION

The concept of the nursing work environment has been recognized as playing a central role in the delivery of safe and quality patient care. Several works have also pointed to the effect of different contextual factors like staffing, resources, management, and information flow on the experiences of caregivers and consequently patients outcomes. Specifically, the role of the nursing work environment nursing care and its effect on patient safety has garnered increased attention in the literature (Faridah et al., 2021).

Some of the studies that were reviewed (Ibrahim & Abohabieb, 2020; Mihdawi et al., 2020), pointed out that negative work environment was a factor that contributed to missed care. In particular, the factors that were associated with missed care included long working hours, stress, and lack of support from the management. Rather, when the nurses had a feeling of being alone and had to work under pressure due to insufficient staff, they were more likely to report that they did not complete tasks, which in turn threatened patient safety (AlRashidi & Al Harbi, 2024).

However, in the absence of or poor leadership, nurses are likely to suffer from burnout, low morale, and stress thus leading to missed care and poor safety. Lack of support from the leadership can also result in lack of communication between the teams which results in unhealthy competition that hampers collaboration thus leading to errors and negligence (Abohabieb, 2020).

Overall, staffing and resources were mentioned as key determinants of the nursing work environment and patient safety in all the studies (Kim et al., 2018; Mihdawi et al., 2020). Nurses have said time and time again that when they are short-staffed or do not have the means to meet the needs of the patients, care suffers (R. N. Al-Dossary, 2022; Lee & Scott, 2018). These are some of the findings that are recurrent in the studies as the authors explore workloads and time pressure as factors contributing to missed care.

CONCLUSION

The conclusions drawn from the reviewed studies have the great implications to healthcare practices. Hospital administrators and nurse managers should address the quality of the nursing work environment in terms of staffing, resources, leadership, and collaboration with other healthcare professionals. Hospitals should therefore develop measures that can help the nurses avoid fatigue, optimize the number of nurses to be taken care of by, and ensure that the nurses have what it takes to deliver quality care. Furthermore, encouraging an environment of safety culture through promoting transparent communication, supportive management, and non- disciplinary reporting of the incidents can also contribute to the enhanced patient safety. The experience and knowledge of the nurses in aspects like communication, teamwork, and patient safety should be enhanced through regular training and development. These measures may enable nurses to exert their decisions and boost their practice, as well as be active participants in fostering a culture of safety and quality care delivery (Mihdawi et al., 2020; Moisoglou et al., 2020).

Limitations and recommendation: The authors attempted to reduce bias and enhance transparency; however, there are limitations that need to be addressed in this review. Most of the studies included are cross-sectional study design and utilized nonprobability sampling, which affects the generalizability of each conducted studies. Another identified limitation of this study is the exclusion of grey literature in conducting the search, Arabic language publications, and studies with mixed populations that lack specificity in their populations Lastly, failure to search CINAHL could pose bias. Therefore, further studies should be conducted in this area.

Data Availability: The data used to support the findings of this study are included within the article.

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Conflicts of interest: The authors declare that there are no conflicts of interest regarding to the publication of this article

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