



Assessing the Impact of Nurse Job Satisfaction on Patient Care Quality: A Systematic Review

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Abstract

Background: We aimed to examine the association between nurse work satisfaction and patient care quality. The goal was to find out key factors influencing nurse's job satisfaction and how these qualities relate to patient care outcomes by synthesizing prior data.

Methods: A literature search was conducted using four databases: PubMed, CINAHL and Embase, published from 2014 and 2023. The inclusion criteria were the impact of nurse job satisfaction on several elements of patient care quality, including safety, effectiveness, patient satisfaction, and overall health outcomes. The research quality was evaluated by established critical evaluation procedures and data were collected and synthesized utilizing standard analysis methodologies.

Results: Eighteen studies satisfied the inclusion criteria, indicating a strong positive relationship between nurse work satisfaction and patient care quality. Organizational support, work environment, professional growth opportunities, and workload management were important factors in determining job satisfaction. Nurse's high job satisfaction levels were consistently linked to increased patient safety, greater patient satisfaction scores, fewer medical mistakes and better overall patient health outcomes.

Conclusion: The findings demonstrate the importance of nurse work satisfaction in improving patient care quality. Healthcare organizations should prioritize tactics that increase worker satisfaction, such as creating supportive work environments, giving opportunities for professional development, and guaranteeing acceptable workloads. By addressing these issues, healthcare systems can enhance patient outcomes and overall healthcare quality.

Keywords: Nurse job satisfaction; Patient care quality; Systematic review; Healthcare outcomes; Work environment; Professional development

Introduction

Nurse job satisfaction (NJS) measures nurse's fulfilment with their work, who is more committed, reduced turnover rates and enhanced motivation, which can improve their performance and

well-being (1). Patient care quality (PCQ) is defined by the efficacy, safety, timeliness, efficiency and patient-centeredness of healthcare services (2,3). High-quality patient care improves health



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outcomes, patient satisfaction, and the healthcare system's performance. Some of the most important PCQ metrics include lower morbidity and mortality rates, less medical errors, shorter patient recovery times and high patient satisfaction. Research has demonstrated a strong connection between the NJS and patient outcomes. Satisfied nurses are more likely to offer high-quality care, which results in improved patient outcomes such as decreased death rates, infection rates and overall patient satisfaction (4,5). Nurses who are unsatisfied with their profession may endure burnout, increased turnover and poor patient care. Supportive management, adequate staffing and professional progression opportunities improve nurse satisfaction, resulting in greater PCQ (6,7).

Assessing NJS influence on PCQ is critical in healthcare settings since nurse well-being and performance have a direct impact on patient outcomes, safety and overall healthcare effectiveness (8,9). Satisfied nurses are more likely to deliver high-quality treatment, which results in decreased patient mortality, fewer medical mistakes and more patient happiness (4,10). Dissatisfied nurses, on the other hand, are more likely to experience burnout, turnover and disengagement, reducing PCQ and raising healthcare costs (11,12). Despite the widely acknowledged relevance of this link, current research shows major gaps, notably in understanding the exact processes by which work satisfaction influences patient care (13,14). Furthermore, there is a dearth of thorough and rigorous evaluations that synthesise data across diverse healthcare contexts and demographics, restricting the capacity to create tailored treatments to improve nurse satisfaction and PCQ (15). Addressing these gaps is crucial to understanding healthcare policy and management approaches to enhance patient outcomes.

This systematic review examines the current evidence on the relationship between NJS and PCQ. By combining data from many studies, we have a better understanding of how nurse satisfaction levels influence safety, efficiency and patient satisfaction. This review focuses on key parameters impacting nurse satisfaction and patient out-

comes. These traits improve the work atmosphere, personnel levels, management techniques, and opportunities for professional development. Considering these components can assist healthcare managers and policymakers develop targeted approaches to improve NJS and PCQ.

Methods

Study Design

This systematic review took a planned and rigorous method to search, evaluate, and synthesise research evidence. This technique aimed to eliminate bias while also providing a comprehensive review of the existing literature on the impact of NJS on PCQ.

Search Strategy

The selection and searching from four databases, PubMed, CINAHL and Embase to collect relevant studies from 2014 to 2023. The following keywords were used: "nurse job satisfaction," "patient care quality," "patient outcomes," "nurse burnout," "job satisfaction in nursing," "healthcare quality" "nursing work environment," "nurse-patient relationship," and "healthcare workforce satisfaction", its equivalent MESH terms tabulated (Table 1).

Inclusion and Exclusion Criteria

Clear inclusion and exclusion criteria were developed to select relevant research (Fig. 1). The review covered quantitative, qualitative, mixed-method, observational, and experimental investigations. Case reports, editorials, opinions and papers that were not peer-reviewed were all excluded. The studies included registered nurses, licensed practical nurses, and other nursing professionals, but studies on non-nursing healthcare professionals or non-healthcare workers were omitted. Outcomes comprised NJS measures, surveys, questionnaires and interviews, as well as PCQ indicators such as patient satisfaction, clinical outcomes and error rates (16).

Table 1: MeSH Terms Corresponding to Key Concepts in Nursing Job Satisfaction and Patient Care Quality

Keyword	MeSH Term(s)
Nurse job satisfaction	Job Satisfaction AND Nurses
Patient care quality	Quality of Health Care OR Delivery of Health Care
Patient outcomes	Treatment Outcome OR Patient Outcome Assessment
Job satisfaction in nursing	Job Satisfaction AND Nursing
Healthcare quality	Quality of Health Care
Nursing work environment	Work Environment AND Nursing Staff, Hospital
Nurse-patient relationship	Nurse-Patient Relations
Healthcare workforce satisfaction	Job Satisfaction AND Health Personnel

Data Extraction and Management

A standardised data extraction form was utilised to capture pertinent information from each included study. This form included information on study's design, sample size, setting, critical fac-

tors, job satisfaction measures and PCQ indicators. Multiple reviewers extracted data separately to verify correctness and consistency. MS Excel was utilised to efficiently organise and handle retrieved data.

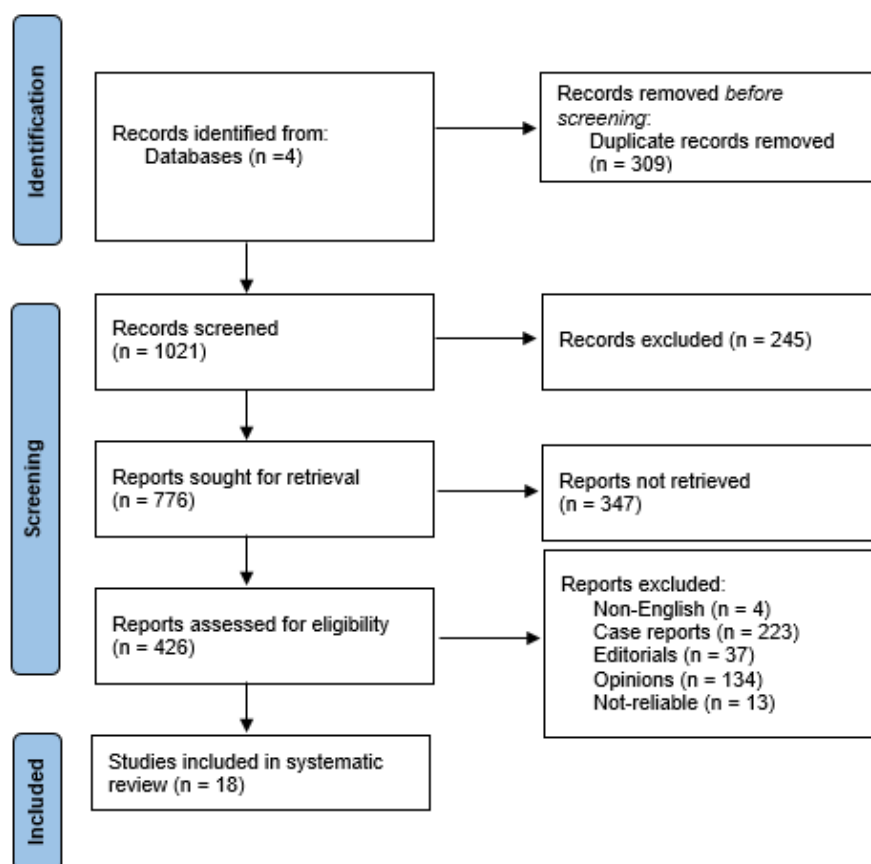


Fig. 1: The PRISMA flowchart depicts the research selection process, with each stage from the initial literature search to the final inclusion of studies in the systematic review and meta-analysis. It illustrates the number of publications detected, duplicates removed, and studies included after screening and full-text review

Quality Assessment

The quality of the included studies was assessed using specified criteria to determine research quality (Tables 2, 3). The Joanna Briggs Institute

(JBI) critical appraisal checklist was used to assess the methodological rigor of cross-sectional studies (Table 4). To resolve disagreements, reviewers discussed them and consulted a third reviewer.

Table 2: Summary of included studies regarding sources of nurse job satisfaction on patient care quality

Author	Countries	Observations	Results	Inferences
Cho et al., (12)	South Korea	Nurse levels and work environment significantly influenced NJS, which affected residents' quality of life in nursing homes.	Residents quality of life was higher with more registered nurses. A better work environment reduces nurse job dissatisfaction.	Nurse levels and work environment were crucial for residents' quality of life. Nurse education levels did not significantly affect resident and nurse outcomes.
Guo et al., (23)	China	Key factors influencing NJS included nurse-patient relationship quality, caring, trust, and professional ethics. Improved satisfaction enhanced PCQ, safety, and rehabilitation outcomes.	Average nurse-patient relational care score: 4.38 ± 0.57 ; Average patients' satisfaction with nursing care score: 5.40 ± 0.86 .	Nurse-patient relationship positively affected nursing care satisfaction. Enhancing nurse-patient relational care improved patient safety.
Simonetti et al., (17)	Chile	Nurse work environment significantly influenced PCQ. Factors like communication, pain control, and timely responses impacted patient satisfaction.	Hospitals with good work environments had higher patient satisfaction rates	Good work environments in hospitals led to better patient experiences. Improving nurse work environments could enhance patient care experiences.
Stemmer et al., (18)	-	Inter-professional collaboration mediated the relationship between nurse work environment, job satisfaction, and patient safety outcomes.	Nurse work environment was associated with improved patient safety outcomes and job satisfaction.	Inter-professional collaboration mediated the relationship between nurse work environment, patient safety outcomes, and job satisfaction.
Friese et al., (19)	USA	Factors influencing NJS in oncology practices include patient safety and clinician communication.	85% of clinicians satisfied with their current position.	Strengthen communication and safety for clinician well-being.
Gür & Ekici, (21)	Turkey	Nurses' job satisfaction is influenced by negative perceptions of quality management programs, impacting PCQ.	Quality management program implementations had little influence on perceptions of the quality of patient care.	Nurses perceive quality management program implementations negatively. Nurses' job satisfaction is negatively affected by these implementations.
Chen et al., (28)	China	Primary nursing implementation positively influences NJS, nurse work environment, and patient outcomes.	Nurses in 2016 reported better quality of patient care and patient safety, while their patients reported	Nurses in 2016 were more satisfied with the work environment and job satisfaction. Primary nursing could be considered effective in improving

Table 2: Continued ...

			higher patient satisfaction.	the nurse work environment and patient outcomes.
Lavoie-Tremblay et al., (27)	Canada	Caring for COVID-19 patients leads to high chronic fatigue, lower work satisfaction, and poor quality of care among nurses.	High chronic fatigue, poor quality of care, lower work satisfaction. Higher intention to leave organization among nurses caring for COVID-19 patients.	Nurses caring for COVID-19 patients experience high chronic fatigue. Support is needed to increase nurse retention during the pandemic.
Loredana et al., (22)	Italy	Key factors influencing NJS and PCQ include understaffing, burnout, job dissatisfaction, and performing non-nursing care.	35.5% of nurses intended to leave their current job due to job dissatisfaction. Push factors included understaffing, emotional exhaustion, poor patient safety, performing non-nursing care, being male.	Nurses' intention to leave is influenced by job dissatisfaction. Factors such as understaffing and non-nursing activities contribute to nurses' intention to leave.
Aiken et al., (4)	UK	Patient satisfaction is influenced by nurse confidence, staffing levels, and work environments. Missed nursing care due to high workloads affects patient perceptions.	Missed nursing care is negatively related to patient ratings of care and positively associated with higher patient-to-nurse ratios.	Patients' perceptions of hospital care are strongly associated with missed nursing care, related to poor nurse staffing and work environments.
Pamela et al., (20)	USA	NJS is influenced by staffing levels, overtime, and work environment, impacting the completion of essential tasks.	NJS is linked to patient safety and quality outcomes; overtime is associated with care left undone in hospitals.	NJS is linked to patient safety and quality outcomes; factors like work environment and hours also impact care quality.
Kvist et al., (25)	Finland	NJS positively influences PCQ, particularly through adequate staffing levels and older patients' satisfaction with staff numbers.	Patients' perceptions of care quality are related to nursing staff job satisfaction; adequate staff numbers are crucial for perceived care quality.	High nursing staff job satisfaction is linked to high care quality; evaluation of resources by staff affects patients' perceptions of staffing.

NA – Not available

Table 3: Source of Patient Care Quality

Source of Care Quality	Key empirical sources
Patient Safety	Simonetti et al., (17); Stemmer et al., (18); Friese et al., (19)
Efficacy	De Cordova et al., (0); Gür & Ekici, 2020 (21); Loredana et al., (22)
Patient Satisfaction	Guo et al., (23); Chen et al., (28); Aiken et al., (4); Kvist et al., (25)
Overall Health Outcomes	Cho et al., (12); Lavoie-Tremblay et al., (27)

Table 4: JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies

Criteria	Yes / No / Unclear / Not Applicable	Comments
1. Were the criteria for inclusion in the sample clearly defined?	Yes	Clearly stated inclusion criteria for hospitals and staff involved.
2. Were the study subjects and the setting described in detail?	Yes	Healthcare settings and participant characteristics are adequately described.
3. Was the exposure measured in a valid and reliable way?	Yes	Nurse staffing and work environment measured using validated instruments.
4. Were objective, standard criteria used for measurement of the condition?	Yes	Patient satisfaction and care quality measured using standardized tools.
5. Were confounding factors identified?	Yes	Factors like hospital size, department, and region were acknowledged.
6. Were strategies to deal with confounding factors stated?	Yes	Statistical controls and multivariate analysis employed.
7. Were the outcomes measured in a valid and reliable way?	Yes	Validated questionnaires and survey instruments were used.
8. Was appropriate statistical analysis used?	Yes	Appropriate descriptive and inferential statistics were applied.

Data Synthesis

The results from the included studies were synthesized using appropriate methods to the data's nature and heterogeneity. Narrative synthesis was used to provide a descriptive summary of the findings. Which enabled a full understanding of the relationship between NJS and PCQ, recognizing key patterns and drawing important conclusions.

Results

Study Selection

A PRISMA flow diagram was used to describe the research selection process, laying out the phases from initial database searches to final study inclusion. Ultimately, the systematic review comprised 18 papers. This summary provided a clear overview of the many pieces of research that contributed to the review's conclusions (Fig. 1).

Characteristics of Included Studies

The features of the included studies were described in depth to help contextualise the findings. This contained data about the many study types employed, such as randomised controlled trials, cohort studies, cross-sectional surveys and qualitative investigations. The sample sizes varied from tiny case studies with a few participants to large-scale surveys with hundreds or thousands of nurses. The venues varied greatly and included hospitals, clinics, long-term care institutions, and community health centres. Job satisfaction ratings and PCQ indicators were among the key factors evaluated in this research.

Findings on Nurse Job Satisfaction

The data on NJS showed varying degrees of satisfaction among researchers. A supportive work environment, good management techniques, manageable workloads, and possibilities for career progression were all factors that contributed to better job satisfaction. Trends revealed that work satisfaction was often better in situations

where nurses had more autonomy, received regular feedback and felt appreciated by their colleagues and superiors. Job satisfaction differs according to shift patterns, staffing numbers and work-life balance.

Methodological heterogeneity was considered by categorizing and synthesizing studies by design. RCTs are analyzed differently from observational studies (cross-sectional) so that outcomes are interpreted more accurately and are not overgeneralized. For instance, RCT findings Guo et al. and Friese et al. having comparatively higher internal validity, are considered more strongly whereas cross-sectional studies are interpreted more cautiously due to limited causal inference.

Findings on Patient Care Quality

The findings on PCQ were evaluated using a variety of measurements and indicators, including patient satisfaction surveys, clinical outcome metrics, and error reporting systems. According to research, greater NJS levels are associated with improved PCQ. Better patient outcomes and higher satisfaction rates were observed in circumstances where nurses reported greater job satisfaction. Furthermore, improvements in care quality were linked to factors such as enough staffing, supportive management, and a positive working environment.

The research on patient safety emphasizes the importance of nurse work conditions and inter-professional teamwork in improving patient safety outcomes. The favorable nurse work conditions, including efficient communication, pain management, and quick answers, substantially increased patient satisfaction and care quality (17). Better working nature in hospitals led to higher patient satisfaction rates, underlining the need to improve nurse working conditions. Stemmer et al. discovered that inter-professional collaboration influences the relationship between nurse working conditions, job satisfaction and patient safety, underlining the importance of collaborative practices (18). Patient safety and clinician communication are major factors influencing NJS in cancer practices, with physicians expressing 85% satisfaction (19). Supportive and collab-

orative work environments for nurse's result in better patient safety outcomes, emphasizing the need to invest in nurse work conditions and fostering inter-professional collaboration to provide safer, higher-quality care.

NJS is strongly associated with patient safety and quality outcomes, with staffing numbers, overtime, and work environment all playing important roles (20). Adequate personnel and appropriate work hours are critical, as overtime is connected with incomplete treatment. Negative attitudes towards quality management programs had a negative influence on nurses' job satisfaction and PCQ, with more favorable emotions in university hospital settings (21). According to Loredana et al. understaffing, burnout, work discontent and non-nursing tasks are key detractors of patient care efficacy, with 35.5% of nurses intending to leave their jobs due to dissatisfaction (22). These findings show the need to address nurse staffing and workload challenges, focusing on supportive work conditions, enough staffing, and good perceptions of quality management. programs to improve job satisfaction and patient care efficacy. Good nurse work circumstances, such as efficient communication and quick answers, resulted in considerably higher patient satisfaction and PCQ (17). Guo et al. highlighted the significance of nurse-patient relationship quality, care, and trust in improving PCQ and satisfaction (23). Proper staffing and a diversified nurse skill set are critical for improving patient-perceived care quality (24). The missing nursing care due to high workloads has a negative influence on patient satisfaction, emphasizing the need for adequate staffing levels (4). Kvist et al. observed a positive association between NJS and PCQ, particularly at appropriate staffing levels (25).

The higher nurse staffing and work settings improved residents' quality of life in nursing homes (26). Care for COVID-19 patients resulted in increased nurse tiredness and poorer work satisfaction, which had a detrimental impact on PCQ (27). The primary nursing improved NJS and working circumstances, leading to better patient outcomes (28). According to Loredana et al understaffing, burnout, and job dissatisfaction all

influenced PCQ and raised nurse turnover intentions (22). These findings emphasize the relevance of a supportive work environment and enough staffing in enhancing patient outcomes.

Relationship between Nurse Job Satisfaction and Patient Care Quality

The association between NJS and PCQ was substantiated by data indicating pleased nurses offered superior patient care. The study summarised studies that showed a clear beneficial relationship between nurse satisfaction and a variety of patient outcomes, including decreased incidence of adverse events and greater patient satisfaction levels. The work environment and staffing levels were identified as mediating variables, with both having a substantial impact on nurse satisfaction and PCQ. For example, supportive management techniques and proper staffing were critical in improving NJS, which had a good influence on patient care. The findings demonstrated the need for addressing these mediating elements to enhance overall healthcare delivery.

Discussion

Nurse work satisfaction improves with flexible schedules, competitive salary packages and professional development programs. Healthcare organizations should promote supportive management practices, maintain adequate staffing levels, and offer career advancement opportunities (29). Policymakers emphasize the importance of creating policies that support safe staffing levels and the well-being of healthcare workers. Policies need acceptable nurse-patient ratios, enforce safe working conditions and provide mental health assistance can help to boost nurse satisfaction and lead to improved PCQ (30-32). Concentrating on these areas assists in addressing the root causes of discontent and improves overall care delivery.

The review combines studies with RCTs and cross-sectional designs. We admitted that merging these heterogeneous designs presented challenges in drawing broad and reliable conclusions.

To compensate for this, results were presented according to study design, emphasizing how differences in methodological rigor might affect the strength of evidence. RCTs usually provided strong evidence supporting causal relationships, while cross-sectional studies only found associations, most probably confounded and suffered from recall bias. Readers are warned that results of observational studies should never be falsely interpreted as evidence for definitive causation. This heterogeneity in methodology compels us to advise moderate interpretation of the overall synthesis.

Implications for Research

The report outlines many critical topics for additional exploration. Longitudinal studies that look at the long-term effects of NJS on patient outcomes are needed to better understand the lasting impact of various interventions. Research might also look at the effectiveness of specific approaches designed to increase nurse satisfaction and their effects on PCQ. Furthermore, studying how different healthcare settings—such as acute care hospitals vs long-term care facilities—influence these correlations may provide important insights into context-specific concerns (33).

The research in the patient safety category illustrates the critical importance of nurse work settings and inter-professional teamwork in improving patient safety outcomes (34). The effective communication and prompt responses enhance patient satisfaction and quality of care (17). The study highlights the importance of improving nurses' work environments to boost patient outcomes, even in the face of challenges like budget constraints and understaffing. Similarly, Stemmer et al. emphasized inter-professional collaboration in shaping the work environment, job satisfaction and patient safety (18). This research advocates for collaborative strategies to foster safer care environments and improve nurse satisfaction.

Good communication and job satisfaction among clinicians are crucial for patient safety in U.S. And suggest that enhancing communication and safety standards can improve patient quality care

(19). Pamela et al emphasized the need of enough personnel and scheduled work hours in the United States to maintain high-quality care, citing the relationship between overtime and incomplete tasks (20). Good attitudes toward quality management programs boost nurse work satisfaction and PCQ, emphasizing the importance of supporting surroundings (21). Understaffing, burn-out and non-nursing duties hinder effective patient care in Italy, suggesting that increasing staffing and reducing non-nursing tasks could improve outcomes (22). Simonetti et al. in Chile showed supportive nurse work environment with good communication and prompt responses improved the patient satisfaction rate and quality care (17). Guo et al. emphasized strong nurse-patient relationships and professional ethics are key to enhancing NJS and patient care outcomes (23). The favourable association between nurse-patient interactions and patient satisfaction emphasizes the need for developing good relational care practices to improve overall patient outcomes.

Winter et al. in Germany underlined the impact of nurse staffing levels and nursing skill mix on patient-perceived quality of care (24). Proper staffing and broad skill mix are critical for increasing patient satisfaction, implying that healthcare policies should take these elements into account when improving nursing care quality. In the United Kingdom, missing nursing care owing to excessive workloads has a detrimental impact on patient perceptions of care (4). This study suggests that proper nurse staffing and moderate workloads are essential for ensuring high patient satisfaction. Key confounders of hospital funding levels and nurse-patient ratios, play a significant role in influencing both nurse job satisfaction and patient outcomes. The missed nursing care is closely linked to staffing adequacy, which in turn affects nurse satisfaction and quality of care. Our synthesis did not fully disentangle these complex relationships. Future studies should aim to control for these confounding variables to better isolate the specific impact of job satisfaction on patient outcomes. The study emphasizes the significance of managing

nurse workloads to provide consistent and high-quality patient care. Kvist et al in Finland revealed a favourable relationship between NJS and PCQ, notably through adequate staffing levels (25). And high nurse job satisfaction rate enhances patient quality care, highlighting the investment in nurse well-being to improve patient experiences. Improved nurse staffing levels and work conditions in nursing homes are connected with increased resident quality of life (26). This shows proper nursing and supportive work conditions enhancing patient health outcomes in long-term care facilities. In Canada, the demands of care for COVID-19 patients resulted in high levels of chronic fatigue and reduced work satisfaction among nurses, negatively impacting PCQ and nurse retention (27). This emphasizes treating nursing exhaustion and providing enough support during health emergencies, to sustain high levels of patient care.

Several investigations have positively correlated nurses' job satisfaction with patient outcomes. Still, some evidence showing no or negative association must be acknowledged and incorporated into the discourse. PCQ to be unaffected by quality management programs, which implies that isolated structural interventions may be insufficient unless supported on a wider organizational basis (21). Lavoie-Tremblay et al. uncovered an erosion of nurse satisfaction as the COVID-19 pandemic took hold, implicating the impact of crisis-win situations on workforce morale. These findings throw the complexity of the relationship into sharper relief and demand interpretations that are cognizant of varying outcomes as reflected in different surroundings and at different times.

This review includes studies conducted across a range of countries, South Korea, China, Chile, USA, Turkey, Canada, Italy, UK and Finland. Each country with distinct cultural, structural, and healthcare system characteristics. While this diversity improves the breadth of perspectives, furthermore familiarises significant contextual variation. Cultural norms, healthcare infrastructure, workforce practices and policy frameworks differ substantially across these settings, which

may influence the execution and outcomes of healthcare interventions. We caution against overgeneralizing the findings to all healthcare systems globally. Instead, consider local adaptations and contextual validations to ensure relevance and applicability within specific health system environments.

Limitations

The overall study on the influence of NJS and work settings on patient outcomes has various limitations. Table 1 shows the studies with limitations such as small sample sizes and recall bias in observational studies. These may reduce reliability in the results and in synthesis. Generalizability of the results with small samples is limited, and self-reports may provide response bias. The frequency of cross-sectional study designs restricts our capacity to demonstrate causal links between NJS and patient outcomes. Furthermore, relying on self-reported data from nurses and patients involves possible bias, which might jeopardize the veracity of the findings. Furthermore, some research is geographically limited, making the results less applicable to other places or healthcare systems. The factors determining nurse satisfaction and patient outcomes may differ among healthcare settings and cultural contexts. Finally, several studies did not completely evaluate other potential influencing factors, such as organizational policies and external economic conditions, that might affect NJS and PCQ. This review was not pre-registered, which may introduce reporting bias. We acknowledge this as a limitation and will register future reviews to enhance transparency.

Conclusion

NJS and work conditions are crucial in predicting PCQ and overall health outcomes. Across several healthcare settings and geographical regions, supportive and well-staffed work environments typically result in higher patient satisfaction, safety, and quality of treatment. Adequate nurse staffing, good communication, moderate workloads

and strong nurse-patient interactions are all necessary for successful patient outcomes. Addressing issues such as understaffing, tiredness and negative perceptions of quality management systems is crucial for enhancing NJS support PCQ. Healthcare institutions and politicians must prioritize improving nurse working conditions and investing in supportive environments to ensure excellent patient care and well-being. To enhance satisfaction, healthcare organizations should consider evidence-based interventions such as leadership training, adequate staffing ratios, and staff recognition. While the study's shortcomings highlight the need for future research, the data clearly demonstrate that increasing NJS is a critical strategy for improving patient health outcomes.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Conflict of interest

The authors declare that there is no conflict of interests.

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