The Impact of Nursing Staffing Levels on Patient Outcomes: A Systematic Review with Implications for Healthcare Policy and Practice

Yashvi Gupta ᵃ, Desly Philip ᵇ, Anusha Raj ᶜ, Manju Rajput ᵈ*, Veena Salilkumar Chaudhary ᵉ and Shikha Gupta ᵈ

ᵃ AIIMS Neuroscience Centre Delhi, India.
ᵇ Corporate Infection Preventionist, WellSpan Health Hospital, PA, USA.
ᶜ Tipperary University Hospital, Ireland.
ᵈ GNIOT Institute of Medical Sciences and Research, Greater Noida, Uttar Pradesh, India.
ᵉ SGT University, Gurugram, Haryana, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Review Article

ABSTRACT

Nursing staffing levels play a critical role in shaping patient outcomes across healthcare settings. This review synthesizes literature to explore the relationship between nursing staffing and patient safety, satisfaction, and clinical outcomes. Specific improvements associated with adequate staffing

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*Corresponding author: Email: manjurajput20@yahoo.com;

include reduced infection rates, lower mortality, and shorter recovery times. The review focuses on healthcare settings such as hospitals and long-term care facilities within regions like North America and Europe, providing a comprehensive understanding of global staffing practices. Key factors influencing staffing levels include financial constraints, regulatory requirements, and hospital policies. Evidence-based staffing guidelines, such as nurse-to-patient ratios and skill-mix models, and increased funding are identified as essential strategies for mitigating adverse events and enhancing patient care quality. Policy recommendations emphasize the adoption of safe staffing standards and targeted investments to support nursing workforce sustainability. Future research should investigate the effects of staffing on diverse patient populations and evaluate innovative staffing models to address the dynamic needs of healthcare systems.

1. INTRODUCTION

The nursing workforce plays a pivotal role in the healthcare system, serving as the primary providers of patient care and significantly impacting health outcomes. Staffing levels within nursing units are a critical determinant of the quality of care delivered and, consequently, patient outcomes. Over the years, substantial research has highlighted the relationship between nursing staffing levels and various aspects of patient care, such as safety, satisfaction, and overall health outcomes. The increasing recognition of this relationship underscores the importance of understanding how staffing levels affect patient care and the need for effective strategies to optimize staffing (Dall'Ora et al. 2022).

Adequate staffing is fundamental for maintaining high standards of care and ensuring patient safety. When nursing staff levels are insufficient, the risk of adverse events, including medication errors, infections, and patient falls, tends to increase. Conversely, appropriate staffing levels enable nurses to provide more thorough monitoring, timely interventions, and personalized care, which can mitigate risks and enhance patient outcomes. Furthermore, adequate staffing is closely linked to patient satisfaction, with better-staffed units generally reporting higher levels of patient contentment and positive care experiences (Yu et al. 2024)

This review seeks to consolidate existing literature on the impact of nursing staffing levels on patient outcomes. By examining various studies and data sources, this review aims to identify key trends, findings, and gaps in current knowledge. Understanding these dynamics is crucial for informing healthcare policy and practice, guiding decisions on resource allocation, and developing strategies to enhance nursing care quality. Ultimately, this review aims to contribute to the broader discourse on improving healthcare delivery and ensuring optimal patient care through effective staffing practices (World Health Organization 2023).

1.1 Key Points for Consideration

1. **Significance of Staffing Levels**: Adequate staffing is essential for preventing adverse events, maintaining patient safety, and improving overall care quality. This section will explore how variations in staffing levels impact different aspects of patient care.
2. **Impact on Patient Safety**: Inadequate staffing levels are associated with an increased incidence of adverse events, such as medication errors and patient falls. This review will examine evidence linking staffing levels with patient safety outcomes.
3. **Patient Satisfaction**: Staffing levels have a direct effect on patient satisfaction. Higher nurse-to-patient ratios are generally associated with improved patient experiences and satisfaction. This review will explore how staffing levels influence patient perceptions and satisfaction.
4. **Healthcare Policy and Practice Implications**: The findings of this review have significant implications for healthcare policy and practice. Effective staffing models, regulatory standards, and resource allocation strategies are essential for optimizing patient care and improving outcomes (Yu et al. 2022).

2. METHODOLOGY

This review was conducted using a systematic approach to identify and analyze relevant literature:

Search Strategy: Articles were sourced from databases such as PubMed, CINAHL, and Scopus using keywords including "nursing staffing," "patient outcomes," "nurse-to-patient ratio," and "staffing guidelines."

Inclusion Criteria: Studies published in English from 2010 to 2023, focusing on the relationship between nursing staffing levels and patient outcomes in acute and long-term care settings.

Exclusion Criteria: Articles that did not provide quantitative or qualitative data on staffing levels or focused exclusively on non-nursing staff.

Analysis: Articles were reviewed for methodological quality, relevance, and alignment with the objectives of this review.

3. OVERVIEW OF NURSING STAFFING AND PATIENT OUTCOMES

Nursing staffing levels play a crucial role in determining the quality of patient care and influencing various patient outcomes. The number of registered nurses (RNs) and other nursing personnel available to care for patients directly affects the ability to provide safe, effective, and compassionate care. This section delves into the relationship between nursing staffing levels and patient outcomes, examining key findings from the literature (Nantsupawat et al. 2017).

3.1. Impact on Patient Safety

Patient safety is significantly influenced by nursing staffing levels. Adequate staffing is essential for reducing the risk of adverse events and ensuring high standards of care. Research has consistently shown that lower staffing levels are associated with an increased incidence of various adverse events:

- **Medication Errors:** Inadequate staffing can lead to a higher likelihood of medication errors, including incorrect dosages and missed medications. Nurses often juggle multiple tasks simultaneously when staffing levels are low, which can contribute to mistakes in medication administration.
- **Infections:** Lower nurse-to-patient ratios have been linked to higher rates of hospital-acquired infections, such as urinary tract infections and surgical site infections. Adequate staffing enables nurses to adhere to infection control protocols more effectively, reducing the incidence of these infections.
- **Falls:** The risk of patient falls increases with lower staffing levels. Nurses play a critical role in monitoring patients at risk of falling and implementing preventive measures. Insufficient staffing can result in less frequent monitoring and interventions, thereby increasing the likelihood of falls (Kerzman et al. 2020).

3.2 Effect on Patient Satisfaction

Patient satisfaction is a key indicator of care quality and is closely related to nursing staffing levels. Research indicates that higher nurse-to-patient ratios positively impact patient satisfaction for several reasons:

- **Increased Time with Patients:** Adequate staffing allows nurses to spend more time with each patient, providing personalized care and addressing patient needs more effectively. This increased interaction contributes to higher levels of patient satisfaction.
- **Personalized Care:** When staffing levels are sufficient, nurses can tailor their care to individual patient preferences and needs, enhancing the overall patient experience. Personalized care is a significant factor in patient satisfaction.
- **Reduced Wait Times:** Higher staffing levels can lead to reduced wait times for treatments and interventions. Patients are more likely to be satisfied with their care when they experience shorter wait times and more timely responses from healthcare providers (Roche et al. 2015).

3.3 Relationship with Clinical Outcomes

Clinical outcomes, such as mortality rates and the incidence of complications, are also closely related to nursing staffing levels. Key findings include:

- **Mortality Rates:** Studies have demonstrated that lower staffing levels are

associated with higher mortality rates. Adequate staffing allows for more frequent monitoring of patients, early detection of deterioration, and prompt interventions, which can reduce mortality rates and improve patient outcomes.

- **Complications:** The likelihood of complications, such as pressure ulcers and thromboembolic events, is influenced by staffing levels. Nurses with manageable workloads can implement preventive measures and provide vigilant care, thereby reducing the incidence of complications (Yakusheva et al. 2020).

4. FACTORS INFLUENCING STAFFING LEVELS

Several factors influence nursing staffing levels, which can significantly impact patient care and outcomes. Understanding these factors is essential for optimizing staffing practices and ensuring high-quality care. This section explores key factors that affect staffing decisions, including financial constraints, regulatory requirements, and hospital policies (Queensland Government 2023).

4.1 Financial Constraints

Financial constraints are a significant factor affecting nursing staffing levels. Healthcare facilities often face budgetary pressures that can influence staffing decisions in various ways:

- **Cost-Cutting Measures:** Financial limitations may lead to cost-cutting measures, such as reducing the number of nursing staff or limiting overtime. These measures can result in higher nurse-to-patient ratios, which can negatively impact patient care and safety. For instance, fewer nurses may lead to increased workloads, reduced time spent with each patient, and a higher likelihood of adverse events.
- **Resource Allocation:** Budgetary constraints can also affect the allocation of resources, including staffing. Facilities may need to prioritize spending on essential services and equipment, which can sometimes come at the expense of adequate staffing levels.
- **Impact on Care Quality:** Inadequate staffing due to financial constraints can lead to poorer patient outcomes, including

increased rates of complications, longer hospital stays, and reduced patient satisfaction. Addressing financial challenges through effective resource management and exploring alternative funding sources can help mitigate the impact on staffing levels and care quality (Polit & Beck 2016).

4.2 Regulatory Requirements

Regulatory requirements and guidelines play a crucial role in shaping nursing staffing levels:

- **Minimum Staffing Ratios:** Some regions have established minimum nurse-to-patient ratios to ensure safe staffing levels. These regulations are designed to protect patient safety and improve care quality by setting standards for the number of nurses required per patient. Compliance with these regulations is essential for maintaining quality care and meeting safety standards (Miles et al. 2014).
- **Accreditation and Licensing:** Regulatory bodies may also have accreditation and licensing requirements that influence staffing practices. Facilities must adhere to these guidelines to maintain their accreditation status and ensure that they meet established care standards.
- **Policy Implementation:** Adhering to regulatory requirements often involves implementing policies and procedures that support safe staffing levels. Understanding and complying with these regulations can help healthcare facilities achieve optimal staffing and improve patient outcomes (Speziale et al. 2011).

4.3 Hospital Policies

Hospital policies and management decisions also play a significant role in determining staffing levels:

- **Staffing Models:** Hospitals may adopt different staffing models based on patient acuity, unit needs, and available resources. Evidence-based staffing models, which consider factors such as patient volume and complexity, can help optimize staffing levels and improve care quality.
- **Nurse Workloads:** Policies related to nurse workloads and patient assignments

can impact staffing levels. For example, policies that ensure manageable workloads and fair distribution of patients can help prevent nurse burnout and improve job satisfaction, leading to better patient care.

- **Data-Driven Decisions:** Making data-driven decisions based on patient acuity, staffing needs, and historical data can help hospitals adjust staffing levels effectively. Implementing systems for monitoring and evaluating staffing practices can support evidence-based decision-making and enhance care quality (Griffiths et al. 2021).

5. IMPLICATIONS FOR HEALTHCARE POLICY AND PRACTICE

The literature on nursing staffing levels and patient outcomes underscores several critical implications for healthcare policy and practice. Addressing these implications can lead to improved care quality, better patient outcomes, and more effective use of healthcare resources. This section outlines key policy and practice recommendations and identifies directions for future research (Ansah et al. 2021).

5.1 Policy Recommendations

1. **Advocating for Evidence-Based Staffing Guidelines:** Policymakers should promote and support the development of evidence-based staffing guidelines that reflect the latest research on staffing levels and patient outcomes. Such guidelines can help ensure that healthcare facilities maintain adequate staffing levels, which is crucial for patient safety and quality of care.

2. **Increasing Funding for Healthcare Facilities:** Adequate funding is essential for maintaining appropriate staffing levels. Policies should aim to increase financial support for healthcare facilities to enable them to hire sufficient nursing staff, invest in staff training, and address other resource needs. This financial support can help mitigate the impact of budgetary constraints on staffing levels.

3. **Implementing Regulations for Safe Nurse-to-Patient Ratios**: Regulations that establish minimum nurse-to-patient ratios can help ensure safe staffing levels across healthcare settings. Policymakers should work to enact and enforce regulations that protect patient safety by setting standards for the number of nurses required per patient.

4. **Addressing Financial Constraints:** Policies should address financial constraints that affect staffing levels by exploring alternative funding sources, such as public health initiatives or grants. Additionally, policy efforts should focus on creating financial incentives for facilities to prioritize staffing and care quality.

5. **Supporting Workforce Development:** Investing in workforce development is crucial for maintaining high staffing levels and ensuring a well-trained nursing workforce. Policies should support ongoing education and professional development opportunities for nurses to enhance their skills and improve patient care (Kelly et al. 2021).

5.2 Practice Recommendations

1. **Adopting Evidence-Based Staffing Models:** Healthcare facilities should adopt staffing models based on current evidence and best practices. These models should consider patient acuity, unit needs, and staffing requirements to optimize care delivery and improve patient outcomes.

2. **Using Data to Inform Staffing Decisions:** Facilities should use data-driven approaches to inform staffing decisions. This includes analyzing patient volume, acuity levels, and historical data to adjust staffing levels dynamically and meet patient needs effectively.

3. **Prioritizing Patient Safety and Satisfaction:** Ensuring that staffing levels are adequate to prioritize patient safety and satisfaction is essential. Facilities should regularly assess patient safety indicators, satisfaction scores, and other metrics to ensure that staffing levels support high-quality care.

4. **Regular Assessment and Adjustment of Staffing Levels:** Healthcare facilities should implement systems for regularly assessing and adjusting staffing levels based on patient needs and other relevant factors. This proactive approach can help address fluctuations in patient acuity and prevent understaffing.

5. **Promoting a Positive Work Environment:** Creating a supportive and positive work environment for nurses can enhance job satisfaction and retention. Facilities should focus on addressing

factors such as workload, work conditions, and opportunities for professional growth to maintain a stable and effective nursing workforce (Shen et al. 2020).

5.3 Future Research Directions

1. **Impact on Specific Patient Populations:** Future research should explore how nursing staffing levels affect specific patient populations, such as those with chronic conditions, elderly patients, or pediatric populations. Understanding these effects can help tailor staffing practices to meet the needs of diverse patient groups (Van den Heede et al. 2020).
2. **Effects of Different Staffing Models:** Research should investigate the effects of various staffing models, such as team-based care or flexible staffing approaches, on patient outcomes. Comparing different models can provide insights into the most effective strategies for optimizing staffing levels (Griffiths et al. 2019).
3. **Long-Term Outcomes of Staffing Interventions:** Evaluating the long-term outcomes of staffing interventions, such as changes in staffing levels or implementation of new models, is crucial for understanding their impact on patient care and organizational performance (World Health Organization 2016).
4. **Cost-Effectiveness of Staffing Practices:** Future studies should assess the cost-effectiveness of different staffing practices and interventions. Understanding the economic implications of staffing decisions can help inform policy and practice decisions that balance cost with care quality (Li et al. 2023, National Health Commission (2021–2025), Aiken et al. 2012, Abhicharttibutra et al. 2017).

6. CONCLUSION

The literature on nursing staffing levels and patient outcomes highlights the critical role that adequate staffing plays in delivering safe, high-quality care. Inadequate staffing is consistently associated with negative outcomes, including compromised patient safety, decreased satisfaction, and poorer clinical outcomes. Conversely, maintaining appropriate staffing levels is linked to improved patient care and better overall outcomes.

To optimize staffing practices and enhance patient care, it is essential to address financial constraints, comply with regulatory requirements, and implement evidence-based staffing models. Financial challenges must be managed through increased funding, effective resource allocation, and supportive policies. Adherence to regulations regarding nurse-to-patient ratios is crucial for ensuring safe staffing levels. Additionally, evidence-based staffing models should be adopted to align staffing with patient needs and acuity levels.

Ongoing research and policy efforts are necessary to refine staffing strategies, address emerging challenges, and support both patients and healthcare professionals. By focusing on these areas, healthcare systems can achieve better patient outcomes, improve the quality of care, and create a more effective and satisfied nursing workforce.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

Abhicharttibutra, K., Kunaviktikul, W., Turale, S., Wichaikhum, O., & Srisuphan, W. (2017). Analysis of a government policy to address nursing shortage and nursing education quality. *International Nursing Review*, *64*(1), 22–32. https://doi.org/10.1111/inr.12257

Aiken, L. H., Sermeus, W., Van den Heede, K., et al. (2012). Patient safety, satisfaction, and quality of hospital care: Cross-sectional surveys of nurses and patients in 12 countries in Europe and the United States. *BMJ, 344*, e1717.

Ansah Ofei, A. M., Paarima, Y., Barnes, T., & Kwashie, A. A. (2021). Staffing the unit with nurses: The role of nurse managers. *Journal of Health Organization and Management, ahead-of-print*.

Dall'Ora, C., Saville, C., Rubbo, B., Turner, L., Jones, J., & Griffiths, P. (2022). Nurse staffing levels and patient outcomes: A systematic review of longitudinal studies. *International Journal of Nursing Studies*, *134*, 104311. 10.1016/j.ijnurstu.2022.104311. Epub 2022 Jun 16. PMID: 35780608.

Griffiths, P., Maruotti, A., Recio Saucedo, A., et al. (2019). Nurse staffing, nursing assistants and hospital mortality: Retrospective longitudinal cohort study. *BMJ Quality & Safety*, *28*(8), 609–617.

Griffiths, P., Saville, C., Ball, J. E., Jones, J., & Monks, T. (2021). Beyond ratios - Flexible and resilient nurse staffing options to deliver cost-effective hospital care and address staff shortages: A simulation and economic modelling study. *International Journal of Nursing Studies*, *117*, 103901.

Kelly, L. A., Gee, P. M., & Butler, R. J. (2021). Impact of nurse burnout on organizational and position turnover. *Nursing Outlook*, *69*(1), 96–102.

Kerzman, H., Van Dijk, D., Siman-Tov, M., Friedman, S., & Goldberg, S. (2020). Professional characteristics and work attitudes of hospital nurses who leave compared with those who stay. *Journal of Nursing Management*, *28*(6), 1364–1371.

Li, M. Q., Wang, Y., Du, M., et al. (2023). Working hours associated with the quality of nursing care, missed nursing care, and nursing practice environment in China: A multicenter cross-sectional study. *Journal of Nursing Management*, *2023*, 8863759.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Los Angeles, CA: SAGE.

Nantsupawat, A., Kunaviktikul, W., Nantsupawat, R., et al. (2017). Effects of nurse work environment on job dissatisfaction, burnout, intention to leave. *International Nursing Review*, *64*(1), 91–98.

National Health Commission. (2021). *Development plan for national nursing career of the PRC (2021–2025)*. Retrieved from http://www.nhc.gov.cn/yzygj/s7653pd/2022 05/441f75ad347b4ed68a7d2f2972f78e67. shtml

Polit, D. F., & Beck, C. T. (2016). *Nursing research: Generating and assessing evidence for nursing practice* (10th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Queensland Government. (2016). *Hospital and health boards (safe nurse-to-patient and midwife-to-patient ratios) amendment bill 2015*. Retrieved from https://www.health.qld.gov.au/ocnmo/nursi ng/nurse-to-patient-ratios

Roche, M. A., Duffield, C. M., Homer, C., Buchan, J., & Dimitrelis, S. (2015). The rate and cost of nurse turnover in Australia. *Collegian*, *22*(4), 353–358.

Shen, Y., Jian, W., Zhu, Q., et al. (2020). Nurse staffing in large general hospitals in China: An observational study. *Human Resources for Health*, *18*(1), 3.

Speziale, H. S., Streubert, H. J., & Carpenter, D. R. (2011). *Qualitative research in nursing: Advancing the humanistic imperative*. Lippincott Williams & Wilkins.

Van den Heede, K., Cornelis, J., Bouckaert, N., et al. (2020). Safe nurse staffing policies for hospitals in England, Ireland, California, Victoria and Queensland: A discussion paper. *Health Policy*, *124*(10), 1064–1073.

World Health Organization. (2016). *Global strategic directions for strengthening nursing and midwifery 2016–2020*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/1 0665/275453/9789241510455-eng.pdf?sequence=1

World Health Organization. (2020). *Global strategy on human resources for health: Workforce 2030*. Retrieved from Assessed 15 May 2023.https://www.who.int/publications/i/ite m/9789241511131

Yakusheva, O., Rambur, B., & Buerhaus, P. I. (2020). Value-informed nursing practice can help reset the hospital-nurse relationship. *JAMA Health Forum*, *1*(8), e200931.

Yu, X., Huang, Y., & Liu, Y. (2022). Nurses' perceptions of continuing professional development: A qualitative study. *BMC Nursing*, *21*(1), 162.

Yu, X., Li, M., Du, M., et al. (2024). Exploring factors that affect nurse staffing: A

descriptive qualitative study from nurse managers' perspective. *BMC Nursing, 23,* 80. https://doi.org/10.1186/s12912-024-01766-7

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/127127