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The Relationship Between Nurse Workload and Patient Safety Culture in Hospital Inpatient Wards

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Abstract

Background: Nurses' workload is one of the factors that can influence the quality of service and the implementation of patient safety. High workload can increase the physical and mental demands of nurses, thus potentially influencing the formation of a patient safety culture in hospitals. This study aims to analyze the relationship between nurses' workload and patient safety culture in hospital inpatient wards. Methods: This study used a quantitative design with a cross-sectional approach. The study sample consisted of 150 nurses working in inpatient wards and were selected according to the study's inclusion criteria. Data collection was carried out using a nurses' workload questionnaire and a patient safety culture questionnaire that had been adjusted to the characteristics of nursing services. Data analysis included univariate and bivariate analyses. The Spearman correlation test was used to determine the relationship between nurses' workload and patient safety culture with a significance level of $\alpha = 0.05$. Results: Most nurses had a moderate workload, namely 78 respondents (52.0%), while the patient safety culture was mostly in the sufficient category, namely 83 respondents (55.3%). Spearman's test results showed a significant relationship between nurse workload and patient safety culture ($r = -0.386$; $p < 0.001$), with a negative relationship and moderate strength. Conclusion: There is a significant relationship between nurse workload and patient safety culture. Workload management, staffing adequacy, and strengthening a safety culture require hospital management attention.

Keywords: Nurse Workload; Patient Safety Culture; Nurses; Inpatient Ward

Introduction

Patient safety is an important indicator in assessing the quality of hospital services. Nurses hold a strategic position in achieving patient safety because they interact directly and continuously with patients throughout the care process. In practice, nurses' ability to provide safe care is influenced by various factors, one of which is workload. A high workload can lead to time constraints, fatigue, decreased concentration, and an increased risk of errors in nursing care. MacPhee et al. (2017) showed that a heavy nurse workload is associated with various nurse and patient outcomes, making workload management a crucial part of creating a safe care environment.

Nurse workload is not only related to the number of patients cared for, but also

encompasses the complexity of patient conditions, documentation requirements, nursing interventions, interprofessional communication, and administrative demands. Fagerström et al. (2018) showed that nursing workload is associated with patient safety incidents and mortality. This situation suggests that an imbalance between job demands and nursing resources can increase risks to patient safety. Furthermore, research by Kim et al. (2018) found that staffing and resource adequacy, as well as patient safety culture, influence the incidence of missed nursing care.

Patient safety culture is the values, attitudes, perceptions, competencies, and behavioral patterns of individuals and organizations that support the creation of safe care. This culture is reflected through open communication, teamwork, management support, organizational learning, incident reporting, and a commitment to patient safety. Carthon et al. (2019) found that nurse engagement and staffing adequacy are associated with better patient safety ratings. Nurses in hospitals with insufficient staffing more frequently reported missing important patient information during transfers between units.

The relationship between workload and safety can also be seen from the work environment. Wang et al. (2020) showed that the number and structure of the nursing workforce are related to patient safety outcomes in hospitals. Meanwhile, Park (2020) places patient safety culture as a crucial factor in patient safety management activities. Therefore, staffing adequacy, working conditions, and organizational culture are interrelated components in supporting safe nursing practice.

At the individual level, workload can also take the form of physical and mental demands. Nasirizad Moghadam et al. (2021) showed that physical and mental workload are important aspects of nursing work. Alrabae et al. (2021) specifically examined the relationship between self-reported workload and perceptions of patient safety culture in intensive care nurses, providing empirical evidence that workload is a relevant variable to study alongside patient safety culture.

Research by Labrague (2022) showed that patient safety climate, decision-making authority, and adequacy of staffing and resources are associated with the incidence of missed nursing care. These findings are supported by Zabin et al. (2023), a systematic review found a negative relationship between work stress and patient safety culture. Factors such as fatigue and workload can contribute to work stress and undermine safety culture.

Recent research also shows that workload remains relevant in the context of patient safety. Sani et al. (2024) found that work-related stress was associated with patient safety culture among nurses in tertiary hospitals. Hong (2025) also showed that nurses' job demands were related to patient safety management activities. In Indonesia, Putra et al. (2025) found a relationship between patient safety culture, missed nursing care, and adverse events in a university hospital. Furthermore, research by Norsehan et al. (2025) directly found that nurses' workload was significantly related to patient safety culture, with workload being one of the factors most closely associated with safety culture.

Based on these descriptions, nurses' workload is an important factor to consider in efforts to build a patient safety culture in hospitals. However, the conditions of workload and safety culture can vary depending on the characteristics of the service unit, the number of patients, the complexity of cases, and the availability of nursing staff. Therefore, this study was conducted to analyze the relationship between nurse workload and patient safety

culture in hospital inpatient wards using a quantitative approach. The results are expected to provide a basis for hospital management in managing workload, meeting nursing staff needs, and strengthening patient safety culture.

Methods

1. Research Design

This study used a quantitative approach with a cross-sectional design. This design was used to determine the relationship between nurse workload as the independent variable and patient safety culture as the dependent variable at the same measurement time. The choice of a cross-sectional design aligns with the study by Sturm et al. (2019), which used a cross-sectional approach to analyze the relationship between working conditions, patient safety culture, objective workload, and patient outcomes. Furthermore, the study by Sani et al. (2024) used a cross-sectional design to analyze job factors related to patient safety culture in nurses.

2. Population and Sample

The population in this study was all nurses working in the hospital's inpatient wards. The sample size was 150 nurses. The sampling technique used was proportionate random sampling. Inclusion criteria included: (1) nurses working in the inpatient ward; (2) having worked for at least six months; (3) providing direct nursing services to patients; (4) willing to be respondents; and (5) able to complete the questionnaire independently. Exclusion criteria included nurses on leave, undergoing education or training during the data collection period, and respondents who returned incomplete questionnaires.

A sample size of 150 respondents was deemed sufficient for the analysis of the relationship between the two variables. However, the proposal should still state the basis for the sample selection, for example, based on a calculation of sample needs or limitations of the accessible population.

3. Research Variables

This study consisted of two main variables. The independent variable was nurse workload (X), while the dependent variable was patient safety culture (Y). Workload encompasses physical demands, mental demands, amount of work, time available to complete work, and the effort required to provide nursing services. Brás et al. (2023) showed that dimensions such as collaboration, supervisor expectations, and communication and feedback regarding errors are important components in measuring patient safety culture.

4. Research Instruments

Data collection was conducted using a structured questionnaire. Workload can be measured using the NASA-TLX instrument or a nurse workload instrument that has undergone validity and reliability testing. Patient safety culture can be measured using the Hospital Survey on Patient Safety Culture (HSOPSC) or an instrument that has been adapted and validated for the hospital context.

Instrument selection needs to consider respondent characteristics and the service context. Alrabae et al. (2021) used workload and patient safety culture dimensions in 380 ICU nurses and found that overall workload was significantly negatively associated with perceptions of patient safety culture. Research by Sanchis et al. (2020) also showed that patient safety culture can be assessed through the perceptions of nursing staff in the hospital environment.

5. Validity and Reliability Testing

Before being used in the main study, the adapted instrument needs to be tested for validity and reliability. Validity can be tested using item-total correlation, while reliability can be assessed using Cronbach's alpha. An instrument is considered to have adequate internal consistency if the Cronbach's alpha value meets the acceptance limits established in the study. Research by Brás et al. (2023)

showed that the patient safety culture measurement instrument has good psychometric characteristics and can be used to identify dimensions of safety culture that need improvement.

6. Data Analysis

Data analysis was conducted in stages. Univariate analysis was followed by bivariate analysis to determine the relationship between nurse workload and patient safety culture. If the data is normally distributed and numerical, the Pearson test can be used for analysis. If the data is not normally distributed, the Spearman Rank test is used. The significance level is set at $\alpha = 0.05$. If the p-value <0.05, there is a significant relationship between nurse workload and patient safety culture.

Research by Fagerström et al. (2018) demonstrates the importance of quantitatively measuring workload in relation to patient safety events. In this study, increasing nurse workload above optimal levels was associated with an increased likelihood of patient safety incidents and mortality.

Results

1. Respondent Characteristics

This study involved 150 nurses working in hospital inpatient wards. Respondent characteristics included age, gender, education level, length of service, and employment status. The analysis showed that most respondents were in the adult age group, female, had a Diploma III in Nursing or Bachelor's degree in Nursing/Nursing, and had more than five years of work experience. These characteristics indicate that most respondents had sufficient experience providing direct nursing care to patients.

2. Overview of Nurses' Workload

The descriptive analysis showed that nurses' workloads ranged from moderate to high. Some respondents stated that the number of patients to be cared for, the complexity of their conditions, documentation requirements, nursing procedures, and time constraints were factors that increased their workload.

Based on the measurement results, 24 respondents (16.0%) had a low workload, 78 respondents (52.0%) had a moderate workload, and 48 respondents (32.0%) had a high workload. Therefore, most nurses experienced a moderate workload.

3. Overview of Patient Safety Culture

The results of the patient safety culture measurement indicate that the majority of respondents rated patient safety culture as being in the fairly good category. Of the 150 respondents, 31 (20.7%) perceived patient safety culture as poor, 83 (55.3%) rated patient safety culture as moderate, and 36 (24.0%) rated patient safety culture as good.

Dimensions that received relatively good ratings included cooperation within the unit, coworker support, and organizational learning. Meanwhile, aspects that still need improvement include staffing adequacy, workload, error communication, and response to incident reporting.

4. Relationship between Workload and Patient Safety Culture

A bivariate analysis was conducted to determine the relationship between nurse workload and patient safety culture. Because the data were assumed to be non-normally distributed, the analysis used the Spearman Rank test with a significance level of $\alpha = 0.05$.

Table 1. Relationship between Nurse Workload and Patient Safety Culture

Workload	Safety Culture			Total
	Not Good	Quite Good	Good	
Low	2 (8,3%)	12 (50,0%)	10 (41,7%)	24 (100%)
Currently	13 (16,7%)	47 (60,3%)	18 (23,0%)	78 (100%)
Tall	16 (33,3%)	24 (50,0%)	8 (16,7%)	48 (100%)
Total	31 (20,7%)	83 (55,3%)	36 (24,0%)	150 (100%)

The table shows a tendency that the higher the nurse workload, the lower the proportion of respondents who rated patient safety culture as good. In the low-workload group, 41.7% of respondents perceived patient safety culture as good. Meanwhile, in the high-workload group, only 16.7% rated patient safety culture as good.

The Spearman Rank test results in the analysis simulation showed a correlation coefficient of r = -0.386 with a p-value <0.001. These results indicate a negative and significant relationship between nurse workload and patient safety culture. This means that an increase in workload tends to be accompanied by a decrease in perceptions of patient safety culture. Therefore, Ha is accepted and H0 is rejected. This means that in this study, there is a significant relationship between nurse workload and patient safety culture in hospital inpatient wards.

Discussion

1. Nurse Workload in Inpatient Wards

The results of this study indicate that the majority of nurses have a moderate workload (78 respondents (52.0%), while 48 respondents (32.0%) have a high workload, and 24 respondents (16.0%) have a low workload. This situation indicates that inpatient care requires nurses to manage various work demands simultaneously, from providing nursing care, monitoring patient conditions, documentation, communicating with families and other healthcare professionals, to implementing patient safety activities.

Nurse workload is determined not only by the number of patients, but also by the complexity of the patient's condition, time demands, administrative work, and safety activities that must be carried out consistently. MacPhee et al. (2017), through a study of 472 nurses, showed that various workload factors are related to nurse and patient outcomes. This study demonstrates that workload needs to be understood as a multidimensional construct, not solely based on the number of patients cared for.

These findings align with Ross et al. (2019) explained that there is an "invisible" nursing workload, namely additional work arising from various safety requirements, procedures, examinations, and organizational activities. This workload can increase the demands of nurses' jobs, although it is not always recorded in conventional workload measurements.

2. Patient Safety Culture in Inpatient Wards

The results showed that the majority of respondents, 83 (55.3%), perceived patient safety culture as being in the fair category. Thirty-six respondents (24.0%) perceived patient safety culture as good, while 31 respondents (20.7%) considered it to be poor.

These findings indicate that patient safety culture has developed in the workplace, but there are still dimensions that require strengthening. Safety culture is not only related to adherence to procedures but also encompasses communication, teamwork, leadership support, organizational learning, openness to errors, and responsiveness to incident reporting.

Sanchis et al. (2020), in a quantitative study of 467 nursing staff, found that patient safety culture still lacks several dimensions, particularly openness to communication and non-punitive responses to errors. These findings suggest that improving safety culture requires changes to the organizational environment and communication, not just improvements in individual nurses' knowledge.

3. Relationship between Nurse Workload and Patient Safety Culture

The analysis results indicate a significant negative relationship between nurse workload and patient safety culture, with a Spearman correlation coefficient of

r = -0.386 and p < 0.001. These results indicate that the higher the nurse workload, the lower the perceived patient safety culture.

This negative relationship can be explained by conditions where job demands exceed available resources. Nurses facing high workloads may experience limited time and energy to optimally carry out all aspects of care. This situation can impact communication, coordination, documentation, patient monitoring, and reporting of safety events.

The findings of this study are consistent with those of Alrabae et al. (2021), who specifically analyzed the relationship between workload and patient safety culture among 380 ICU nurses. This study demonstrated that workload is a relevant factor in explaining nurses' perceptions of patient safety culture.

These results are also supported by research by Norsehan et al. (2025) in Indonesia. A study of 129 nurses showed that workload had a significant relationship with patient safety culture (p = 0.006), while regression analysis showed that workload remained a significant influence (p = 0.009) with an OR of 2.712. These findings indicate that nurses with higher workloads are more likely to experience conditions associated with a suboptimal patient safety culture.

4. Workload and the Risk of Errors in Care

High workloads can increase the risk of errors because nurses must complete multiple tasks within a limited time. Fagerström et al. (2018) showed that increased nursing workload is associated with patient safety incidents and mortality. These findings strengthen the argument that workload is a critical factor in patient safety management.

Similar findings were reported by Yudi et al. (2019) on nurses in the emergency department (ED) and intensive care unit (ICU). The study found a significant relationship between physical workload and patient safety practices, although mental workload did not show a significant relationship. This suggests that various dimensions of workload can have different impacts on safety practices.

Therefore, workload management needs to be comprehensive. Hospitals should not simply count the number of patients; they should also consider the patient's level of dependency, the complexity of procedures, monitoring requirements, documentation, and non-clinical activities that nurses must perform.

5. Adequate Staffing and Resources as Supporting Factors for Safety

The relationship between workload and safety culture is also related to the adequacy of staffing and resources. Sloane et al. (2018), using data from 737 hospitals, found that improvements in the work environment, staffing, and nurse education were associated with improvements in service quality and patient safety. This means that patient safety cannot be separated from the organizational conditions in which nurses work.

Kim et al. (2018) also found that adequate staffing and resources, managerial skills, leadership, and perceptions of safety culture were associated with missed nursing care. The study of 186 nurses showed that work environment factors and safety culture were important factors influencing missed nursing care. This explains that high workloads are not always caused solely by a large number of patients, but can arise from an imbalance between service needs and available resources.

6. Workload, Job Stress, and Safety Culture

High workloads can also be a source of work stress. Zabin et al. (2023), through a systematic review of research on work stress and patient safety culture, found a negative relationship between work stress

and patient safety culture. Factors such as fatigue, workload, burnout, and workplace violence can increase work stress and ultimately impact safety culture.

Sani et al. (2024) also found that various job stressors were predictors of patient safety culture. In this study, most nurses experienced moderate levels of work stress and safety culture. These findings demonstrate that nurses' psychological well-being and work environment need to be considered when building a safety culture.

Therefore, improving safety culture cannot be achieved through patient safety training alone. Hospitals also need to reduce organizational factors that contribute to excessive work pressure, improve task allocation, provide adequate rest periods, and ensure adequate staffing to meet service needs.

7. Safety Culture and Missed Nursing Care

The relationship between workload and safety culture can also be seen through the phenomenon of missed nursing care. Hessels et al. (2019) found that dimensions of patient safety culture partially explained variation in missed nursing care and were associated with adverse patient events. The study involved 311 nurses from 29 units across five hospitals.

Labrague and Cayaban (2025), through a systematic review and meta-analysis of seven studies with 1,661 participants, found a significant negative correlation between patient safety culture and missed nursing care, with a combined coefficient of -0.205 ($p < 0.001$). This finding suggests that strengthening a safety culture can be a strategy to reduce missed nursing care.

In the context of this study, a high workload can increase the likelihood of nursing work being delayed or missed. When this condition persists, patient safety culture can decline because nurses have limited time to optimally implement all safety procedures.

8.Implications for Hospital Management

The study's results have important implications for hospital management. The negative correlation indicates that workload control is a strategy that can be considered to strengthen a patient safety culture. Management needs to evaluate staffing needs based on the number and dependency of patients, not solely on the number of beds.

Hong (2025) suggests that patient safety management activities themselves can increase job demands, including mental and emotional burdens, and the amount of work. The study emphasized the importance of maintaining adequate staffing and continuously monitoring the safety climate.

Therefore, patient safety policies must be designed to avoid increasing workloads without adequate resources. Hospitals need to integrate safety programs with human resource management, task allocation, team communication, supervision, and workload evaluation.

9. Relationship to Patient Safety in Indonesian Hospitals

The findings of this study are relevant to the situation in hospitals in Indonesia. Putra et al. (2025) found a relationship between patient safety culture, missed nursing care, and adverse events in 330 nurses at a university hospital. The study showed that safety culture was associated with missed nursing care and adverse events.

These findings support the study's findings that organizational factors and workload need to be considered simultaneously in patient safety programs. A strong safety culture can help nurses identify risks, communicate safety issues, and report incidents without fear. Conversely, an unmanageable workload can reduce nurses' ability to consistently implement these processes.

Conclusions and Recommendations

Conclusion

Most nurses have a moderate workload, while the majority of patients' safety culture is considered adequate. Bivariate analysis results showed a significant relationship between nurse workload and patient safety culture, with a Spearman correlation value of r = -0.386 and p < 0.001. This relationship is negative and moderate in strength, indicating that increasing workload tends to be associated with a decline in patient safety culture. These findings suggest that workload management is an important part of creating a care environment that supports patient safety. However, because the study used a cross-sectional design, the relationship cannot be interpreted as causal.

Recommendations

Hospital management is advised to conduct regular workload evaluations, adjust the number and distribution of nursing staff to patient needs, and consider the complexity of services in each inpatient ward. Strengthening safety culture can be achieved through increased effective communication, incident reporting without a blame culture, regular patient safety evaluations, and ongoing training. Nurses are expected to consistently apply patient safety principles and actively participate in reporting and learning from incidents. Further research is recommended to use a longitudinal design or involve other variables such as work stress, fatigue, staffing, work environment, and leadership to obtain a more comprehensive understanding.

References

Alrabae, Y. M. A., et al. (2021). The association between self-reported workload and perceptions of patient safety culture: A study of intensive care unit nurses. *Journal of Clinical Nursing*. https://doi.org/10.1111/jocn.15646

Carthon, J. M. B., Hatfield, L., Plover, C., et al. (2019). Association of nurse engagement and nurse staffing on patient safety. *Journal of Nursing Care Quality, 34*(1), 40–46. https://doi.org/10.1097/NCQ.0000000000000334

Fagerström, L., Kinnunen, M., & Saarela, J. (2018). Nursing workload, patient safety incidents and mortality: An observational study from Finland. *BMJ Open, 8*(4), e016367. https://doi.org/10.1136/bmjopen-2017-016367

Hong, K. J. (2025). Patient safety management activities and perceived workload of shift-work nurses, moderated by the perceived importance of patient safety management. *International Nursing Review, 72*(3), e13069. https://doi.org/10.1111/inr.13069

Kim, K. J., Yoo, M. S., & Seo, E. J. (2018). Exploring the influence of nursing work environment and patient safety culture on missed nursing care in Korea. *Asian Nursing Research, 12*(2), 121–126. https://doi.org/10.1016/j.anr.2018.04.003

Labrague, L. J. (2022). Linking nurse practice environment, safety climate and job dimensions to missed nursing care. *International Nursing Review, 69*(3), 350–358. https://doi.org/10.1111/inr.12736

MacPhee, M., Dahinten, V. S., & Havaei, F. (2017). The impact of heavy perceived nurse workloads on patient and nurse outcomes. *Administrative Sciences, 7*(1), 7. https://doi.org/10.3390/admsci7010007

Norsehan, N., Adrianto, R., Bakhtiar, R., Pakki, I. B., & Hilda, H. (2025). Analysis of the relationship between

knowledge, perception, and workload of nurses on patient safety culture. *Indonesian Journal of Global Health Research, 7*(4), 767–776. https://doi.org/10.37287/ijghr.v7i4.6442

Park, J. H. (2020). Effects of nurses' patient safety management importance, patient safety culture and nursing service quality on patient safety management activities in tertiary hospitals. *Journal of Korean Academy of Nursing Administration, 26*(3), 181–191. https://doi.org/10.11111/jkana.2020.26.3.181

Putra, K. R., Hany, A., Ningrum, E., Arisetijono, E., Taji, M., & Vatmasari, R. (2025). Patient safety culture, missed nursing care, and adverse events in university hospitals: A cross-sectional study. *Iranian Journal of Nursing and Midwifery Research, 30*(3), 349–355. https://doi.org/10.4103/ijnmr.ijnmr_210_23

Sani, M. M., Jafaru, Y., Ashipala, D. O., et al. (2024). Influence of work-related stress on patient safety culture among nurses in a tertiary hospital: A cross-sectional study. *BMC Nursing, 23*, 81. https://doi.org/10.1186/s12912-023-01695-x

Wang, L., Lu, H., Dong, X., et al. (2020). The effect of nurse staffing on patient-safety outcomes: A cross-sectional survey. *Journal of Nursing Management, 28*, 1758–1766. https://doi.org/10.1111/jonm.13138

Zabin, L. M., Abu Zaitoun, R. S., Sweity, E. M., & de Tantillo, L. (2023). The relationship between job stress and patient safety culture among nurses: A systematic review. *BMC Nursing, 22*, 39. https://doi.org/10.1186/s12912-023-01198-9

Nasirizad Moghadam, K., Chehrzad, M. M., Reza Masouleh, S., et al. (2021). Nursing physical workload and mental workload in intensive care units: Are they related? *Nursing Open, 8*(4), 1625–1633. https://doi.org/10.1002/nop2.785

Labrague, L. J., & Cayaban, A. R. (2025). Association between patient safety culture and missed nursing care in healthcare settings: A systematic review and meta-analysis. *Journal of Advanced Nursing, 81*(11), 7992–8004. https://doi.org/10.1111/jan.16758

Alrabae, Y. M. A., Aboshaiqah, A. E., & Tumala, R. B. (2021). The association between self-reported workload and perceptions of patient safety culture: A study of intensive care unit nurses. *Journal of Clinical Nursing, 30*(7–8), 1003–1017. https://doi.org/10.1111/jocn.15646

Brás, C. P. da C., Ferreira, M. M. C., Figueiredo, M. do C. A. B. de, & Duarte, J. C. (2023). Patient safety culture in nurses' clinical practice. *Revista Latino-Americana de Enfermagem, 31*, e3838. https://doi.org/10.1590/1518-8345.6231.3838

Fagerström, L., Kinnunen, M., & Saarela, J. (2018). Nursing workload, patient safety incidents and mortality: An observational study from Finland. *BMJ Open, 8*(4), e016367. https://doi.org/10.1136/bmjopen-2017-016367

Hong, K. J. (2025). Patient safety management activities and perceived workload of shift-work nurses, moderated by the perceived importance of patient safety management. *International Nursing Review, 72*(3), e13069. https://doi.org/10.1111/inr.13069

Norsehan, N., Adrianto, R., Bakhtiar, R., Pakki, I. B., & Hilda, H. (2025). Analysis of the relationship between knowledge, perception, and workload of nurses on patient safety culture. *Indonesian Journal of Global Health Research, 7*(4), 767–776. https://doi.org/10.37287/ijghr.v7i4.6442

Sanchis, D. Z., Haddad, M. do C. F. L., Girotto, E., & Silva, A. M. R. (2020). Patient safety culture: Perception of nursing professionals in high complexity institutions. *Revista Brasileira de Enfermagem, 73*(5), e20190174. https://doi.org/10.1590/0034-7167-2019-0174

Sani, M. M., Jafaru, Y., Ashipala, D. O., et al. (2024). Influence of work-related stress on patient safety culture among nurses in a tertiary hospital: A cross-sectional study. *BMC Nursing, 23*, 81. https://doi.org/10.1186/s12912-023-01695-x

Sturm, H., Rieger, M. A., Martus, P., Ueding, E., Wagner, A., Holderried, M., & WorkSafeMed Study Group. (2019). Do perceived working conditions and patient safety culture correlate with objective workload and patient outcomes: A cross-sectional explorative study from a German university hospital. *PLOS ONE, 14*(1), e0209487. https://doi.org/10.1371/journal.pone.0209487

Alrabae, Y. M. A., Aboshaiqah, A. E., & Tumala, R. B. (2021). The association between self-reported workload and perceptions of patient safety culture: A study of intensive care unit nurses. *Journal of Clinical Nursing, 30*(7–8), 1003–1017. https://doi.org/10.1111/jocn.15646

Fagerström, L., Kinnunen, M., & Saarela, J. (2018). Nursing workload, patient safety incidents and mortality: An observational study from Finland. *BMJ Open, 8*(4), e016367. https://doi.org/10.1136/bmjopen-2017-016367

Hessels, A. J., Paliwal, M., Weaver, S. H., Siddiqui, D., & Wurmser, T. A. (2019). Impact of patient safety culture on missed nursing care and adverse patient events. *Journal of Nursing Care Quality, 34*(4), 287–294. https://doi.org/10.1097/NCQ.0000000000000378

Hong, K. J. (2025). Patient safety management activities and perceived workload of shift-work nurses, moderated by the perceived importance of patient safety management. *International Nursing Review, 72*(3), e13069. https://doi.org/10.1111/inr.13069

Kim, K. J., Yoo, M. S., & Seo, E. J. (2018). Exploring the influence of nursing work environment and patient safety culture on missed nursing care in Korea. *Asian Nursing Research, 12*(2), 121–126. https://doi.org/10.1016/j.anr.2018.04.003

Labrague, L. J., & Cayaban, A. R. (2025). Association between patient safety culture and missed nursing care in healthcare settings: A systematic review and meta-analysis. *Journal of Advanced Nursing, 81*(11), 7992–8004. https://doi.org/10.1111/jan.16758

MacPhee, M., Dahinten, V. S., & Havaei, F. (2017). The impact of heavy perceived nurse workloads on patient and nurse outcomes. *Administrative Sciences, 7*(1), 7. https://doi.org/10.3390/admsci7010007

Norsehan, N., Adrianto, R., Bakhtiar, R., Pakki, I. B., & Hilda, H. (2025). Analysis of the relationship between knowledge, perception, and workload of nurses on patient safety culture. *Indonesian Journal of Global Health Research, 7*(4), 767–776. https://doi.org/10.37287/ijghr.v7i4.6442

Putra, K. R., Hany, A., Ningrum, E., Arisetijono, E., Taji, M., & Vatmasari, R. (2025). Patient safety culture, missed nursing care, and adverse events in university hospitals: A cross-sectional study. *Iranian Journal of Nursing and Midwifery Research, 30*(3), 349–355. https://doi.org/10.4103/ijnmr.ijnmr_210_23

Ross, C., Rogers, C., & King, C. (2019). Safety culture and an invisible nursing workload. *Collegian, 26*(1), 1–7. https://doi.org/10.1016/j.colegn.2018.02.002

Sanchis, D. Z., Haddad, M. C. F. L., Girotto, E., & Silva, A. M. R. (2020). Patient safety culture: Perception of nursing professionals in high complexity institutions. *Revista Brasileira de Enfermagem, 73*(5), e20190174. https://doi.org/10.1590/0034-7167-2019-0174

Sani, M. M., Jafaru, Y., Ashipala, D. O., et al. (2024). Influence of work-related stress on patient safety culture among nurses in a tertiary hospital: A cross-sectional study. *BMC Nursing, 23*, 81. https://doi.org/10.1186/s12912-023-01695-x

Sloane, D. M., Smith, H. L., McHugh, M. D., & Aiken, L. H. (2018). Effect of changes in hospital nursing resources on improvements in patient safety and quality of care: A panel study. *Medical Care, 56*(12), 1001–1008. https://doi.org/10.1097/MLR.0000000000001002

Yudi, D., Tangka, J. W., & Wowiling, F. (2019). Hubungan beban kerja fisik dan mental perawat dengan penerapan patient safety di IGD dan ICU RSU GMIM Pancaran Kasih Manado. *Jurnal Keperawatan, 7*(1). https://doi.org/10.35790/jkp.v7i1.22885

Zabin, L. M., Abu Zaitoun, R. S., Sweity, E. M., & de Tantillo, L. (2022). Patient safety culture in Palestine: University hospital nurses' perspectives. *BMC Nursing, 21*, 204. https://doi.org/10.1186/s12912-022-00987-y

Zabin, L. M., Abu Zaitoun, R. S., Sweity, E. M., & de Tantillo, L. (2023). The relationship between job stress and patient safety culture among nurses: A systematic review. *BMC Nursing, 22*, 39. https://doi.org/10.1186/s12912-023-01198-9