Relationship Between Nurses' Workload and Surgical Safety Checklist Implementation at Nahdlatul Ulama Islamic Hospital Demak

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ABSTRACT

The Surgical Safety Checklist (SSC) is an essential tool for enhancing patient safety in the operating room; however, its implementation can be influenced by nurses' workload, particularly in the Central Surgical Installation (IBS) at Nahdlatul Ulama Islamic Hospital (RSI NU) Demak. This study employed a quantitative cross-sectional design involving 15 nurses, with data collected through a workload questionnaire and SSC implementation observations, followed by univariate and bivariate analysis using Spearman's correlation. Results showed that the majority of nurses experienced a light workload (67%), with a smaller proportion in the moderate category and very few in the heavy category, possibly influenced by long work experience (>20 years) causing some nurses to perceive routine tasks as light. Most SSC implementations were classified as good (60%), with a smaller number rated as fairly good, and very few rated as poor. Bivariate analysis indicated a significant positive correlation between nurses' workload and SSC implementation (r_s = 0.549, p = 0.034). These findings suggest that even among nurses with higher workloads, SSC implementation remains good, likely influenced by extensive work experience, professional motivation, and a strong safety culture in the IBS. Nurses with lower SSC performance may benefit from targeted refresher training or additional supervision to ensure the quality and safety of surgical care is maintained.

KEYWORDS
Nurse workload, Surgical Safety Checklist, Central Surgery Installation

1. BACKGROUND

The operating room is one of the vital hospital units with a high risk to patient safety. Data from the Indonesian Ministry of Health shows that 27% of hospital patient safety incidents are related to surgical procedures (Tirzaningrum et al., 2022). Therefore, the implementation of patient safety standards in the operating room is crucial, including the use of the Surgical Safety Checklist (SSC) recommended by the WHO (Samson et al., 2021). The SSC has been proven to improve service quality and reduce incidents that endanger patients (Purwanti et al., 2022), but its

implementation in Indonesia is still relatively low (Weiser & Haynes, 2018).

The implementation of the SSC in various hospitals, including Nahdlatul Ulama Islamic Hospital (RSI NU) Demak, is inconsistent and tends to increase only approaching accreditation. Many errors in checklist completion are found, such as failure to record the administration of prophylactic antibiotics, estimation of operation duration, and the count of medical instruments (Purwanti et al., 2022). Research at RSI Sultan Agung Semarang even recorded a non-compliance rate in SSC completion reaching 56.3% (Ilmi, 2024), indicating the need to strengthen SSC implementation so it does not become merely a formality but a sustainable work culture.

One important factor influencing SSC implementation is the workload of perioperative nurses. Nurses have significant responsibilities from before to after surgery, including patient condition monitoring and instrument management, which can create both quantitative and qualitative workload (Purwanti et al., 2022; Novita et al., 2022). Research in Brazil shows that 50% of nurses' workload is influenced by operation duration and length of stay in the recovery room (Samson et al., 2021). High workload can potentially decrease compliance with SSC implementation, as found in Bali where nurses with a moderate workload showed moderate SSC compliance (Prilanti, 2022).

Nahdlatul Ulama Islamic Hospital (RSI NU) Demak, as a class C hospital with a high patient volume, faces challenges in maintaining service quality and patient safety. Until now, no research has examined the relationship between nurses' workload and the implementation of the SSC in the hospital's Central Surgical Installation. Therefore, this research is important to provide empirical evidence regarding the specific factors influencing SSC compliance at this institution.

2. METHODS

This study used a quantitative approach with an analytic descriptive method and a cross-sectional design, which examines the relationship between risk factors and their outcomes through data collection at a single point in time (Notoatmodjo, 2018). The independent variable was nurses' workload, while the dependent variable was the implementation of the Surgical Safety Checklist (SSC) in the Central Surgical Installation of the Nahdlatul Ulama Islamic Hospital (RSI NU) Demak.

The research was conducted over 1 month from May 1, 2025, to May 31, 2025. The research population was all nurses in the Central Surgical Installation of Nahdlatul Ulama Islamic Hospital (RSI NU) Demak, totaling 15 people. The sampling technique used total sampling, so the entire population was taken as the sample (Notoatmodjo, 2018; Sugiyono, 2022). Thus, the number of samples was 15 respondents.

The research instruments consisted of two questionnaires. The first was a nurse workload questionnaire adapted from Nursalam (2022) with 16 items, previously tested valid (r-count > 0.443) and reliable (Cronbach's Alpha = 0.827) (Aswadi, 2019). Each item was scored on a 0–3 scale, producing a total score between 0 and 64, which was categorized into four levels: no workload (0–15), light (16–31), moderate (32–47), and heavy (48–64). The second instrument was a Surgical Safety Checklist (SSC) implementation questionnaire adopted from WHO (2019) using the instrument developed by Prilanti (2022). Although not re-tested for validity and reliability, it was content-validated by two expert lecturers in the relevant field. This questionnaire employed closed-ended items (Guttman scale) consisting of 15 indicators with "Yes" (1) or "No" (0) responses. Scores were calculated using the formula (total score/15) × 100%, and categorized as good (80%–100%), fair (60%–79%), or poor (<60%). Each nurse respondent completed the questionnaires once during the study period (May 1–31, 2025). Although administered only once, the items reflected the nurses' daily practices, such as routinely checking patient identity before surgery.

Data were analyzed quantitatively, including descriptive analysis to describe respondent characteristics and variable distribution, and bivariate analysis using Spearman's correlation test. The research received ethical approval from the Ethics Commission of the Faculty of Health Sciences, UNIPDU Jombang, with number 065-KEP-UNIPDU/06/2025. The researcher adhered to research ethical principles according to Council for International Organizations of Medical Sciences (CIOMS, 2016), including informed consent, anonymity, confidentiality, beneficence, justice, and protection from discomfort.

3. Results

Respondent Characteristics

Respondent characteristics in this study included gender, age, nurse type, length of work, and highest education.

Table 1. Frequency Distribution of Respondents Based on Demographic Data (n=15)

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	13	86.7
	Female	2	13.3
Age	26–35 years (Early Adulthood)	8	53.3
	36–45 years (Late Adulthood)	3	20
	46–55 years (Early Elderly)	3	20
	56–65 years (Late Elderly)	1	6.7
Nurse Type	Anesthesia	3	20
	Instrument	12	80
Length of Work	1–5 years	2	13.3
	6–10 years	1	6.7
	>20 years	12	80
Highest Education	Diploma + Training	4	26.7
	Bachelor of Nursing + Professional	11	73.3

Based on Table 1, almost all research respondents were male (86.7%), with the largest age group being 26-35 years (53.3%), which is a productive age. Based on nurse type, the majority were instrument nurses (80%). In terms of work experience, almost all respondents had worked for more than 20 years (80%), indicating a high level of seniority. Meanwhile, in terms of educational background, most had a Bachelor of Nursing + Professional Nurse education (73.3%), so respondents were considered to have adequate qualifications for service in the operating room.

Nurses' Workload

Table 2. Frequency Distribution of nurses' Workload (n=15)

Workload Type	Frequency	Percentage (%)
Not a Workload	0	0
Light Workload	10	67
Moderate Workload	4	27
Heavy Workload	1	7

The measurement results in Table 2 show that the majority of respondents experienced a light workload (67%), followed by moderate (27%), and heavy (7%), while no one was in the 'not workload' category. This finding indicates that nurses' workload is generally at a light to moderate level, although attention is still needed for individuals with a heavy workload to prevent negative impacts on performance and health.

Surgical Safety Checklist (SSC) Implementation

Table 3. Frequency Distribution of SSC Implementation (n=15)

SSC Implementation	Frequency	Percentage (%)
Good	9	60
Fairly Good	4	27
Poor	2	13

Based on Table 3, the implementation of the Surgical Safety Checklist (SSC) by operating room nurses was mostly good, with 9 people (60%). However, there were still 4 people (27%) who rated it as fairly good and 2 people (13%) who rated it as poor. This shows that SSC implementation is running quite optimally, but consistency and optimization still need to be improved to ensure better patient safety during surgical procedures.

The Relationship between Workload and Surgical Safety Checklist (SSC) Implementation

Bivariate analysis was conducted to determine the relationship between nurses' workload and the implementation of the Surgical Safety Checklist (SSC). The results of the Spearman correlation test are presented in Table 4

Table 4. Bivariate Analysis of the Relationship between Workload and Surgical Safety Checklist (SSC) Implementation

Variable	Correlation Coefficient (rs)	Sig. (2-tailed)	Description
Workload SSC Implementation	0.549	0.034	Significant (p < 0.05)

Based on Table 4, the Spearman correlation test results show a significant positive relationship between nurses' workload and the implementation of the Surgical Safety Checklist (SSC) (rs = 0.549; p = 0.034). This finding indicates that an increased workload is followed by an increase in SSC implementation, possibly due to awareness of patient safety and strict supervision in the operating room. Thus, workload is proven to have a significant influence on the quality of SSC implementation in the Central Surgical Installation of Nahdlatul Ulama Islamic Hospital (RSI NU) Demak, making workload management important to support patient safety.

4. DISCUSSION

The results show that the majority of nurses in the Central Surgical Installation (IBS) of Nahdlatul Ulama Islamic Hospital (RSI NU) Demak experienced a light workload (67%), followed by moderate (27%), and heavy (7%). No one was in the 'not workload' category. Field facts indicate that the long work experience of some nurses (more than 20 years) allows for more efficient task completion, leading to a perception of a lighter workload. Nevertheless, groups with moderate to heavy workloads still need attention, as the potential for imbalance between shifts and individuals can impact performance and patient safety.

Surgical services demand high precision, readiness to face emergency cases, and complex team coordination. If the number of staff is not proportional to the volume of operations (250-300 operations per month at Nahdlatul Ulama Islamic Hospital (RSI NU) Demak), workload accumulation can trigger fatigue. Literature emphasizes that workload must be analyzed quantitatively and qualitatively because task complexity greatly influences stress and performance (Wikurendra, 2018; Samson et al., 2021). This finding differs from research by Ilmi (2023) at RSI Sultan Agung Semarang, where the majority of IBS nurses actually experienced a heavy workload (37.5%). This difference in distribution shows the influence of institutional characteristics, operation volume, and human resource management.

The researcher assesses that although the majority of the workload is classified as light, the presence of groups with moderate to heavy workloads still has the potential to affect service quality. This aligns with Maulidin (2023), who emphasizes the importance of balanced task distribution to prevent a decline in service quality. The negative impact of a heavy workload is also shown by Risanti et al. (2021) and McPhee et al. (2017), namely negligence in SSC documentation, an increase in medical error incidents, and mental fatigue affecting clinical concentration (Koesomowidjojo, 2017).

Based on the research results, the majority of nurses in the IBS of Nahdlatul Ulama Islamic Hospital (RSI NU) Demak implemented the SSC in the good category (60%), while 27% were fairly good, and 13% were poor. This shows that SSC practice is generally good, although not optimal for all items. WHO (2009) affirms that consistent use of the SSC can reduce the risk of medical errors, while Strople & Ottani (2006)

emphasize the influence of safety culture and organizational support on compliance.

Variations in SSC implementation at Nahdlatul Ulama Islamic Hospital (RSI NU) Demak are likely influenced by factors of experience, knowledge, intraoperative team communication, and supervisory support. Experienced nurses tend to be more consistent than new ones. Therefore, improving SSC implementation can be done through routine training, strengthening supervision by the head nurse, and habituating the checklist as a patient safety culture. With this strategy, SSC implementation has the potential to be more consistent, and the risk of medical errors can be reduced.

Bivariate analysis shows a significant positive relationship between nurses' workload and SSC implementation (rs = 0.549; p = 0.034). This means that the higher the workload, the more SSC implementation increases. This finding is in line with Apriana (2018), who reported a similar significant relationship (p = 0.005). Workload can affect physical and emotional capacity, but negative impacts can be minimized with good work system support (Fatmawati, 2019). Supervisory support, training, and safety culture at Nahdlatul Ulama Islamic Hospital (RSI NU) Demak are likely driving factors for compliance even as workload increases.

However, this result differs from research by Siswanto (2013) and Samson et al. (2020), who found a negative correlation among anesthesia nurses, where high workload decreased SSC compliance. This difference can be explained by variations in management systems, number of staff, and work culture in each institution. Workload is influenced by external factors (patient volume, facilities) and internal factors (motivation, physical condition) (Fatmawati, 2019). Thus, although high workload is often associated with decreased compliance, this study shows the opposite result: with adaptive workload management, SSC implementation can actually increase.

Nevertheless, this finding must be interpreted with caution given methodological limitations. The study involved only 15 nurses, of whom 80% had more than 20 years of experience. Therefore, these are highly likely senior staff with advanced clinical skills, intrinsic motivation, and a strong safety culture within the unit. Their classification as having a 'heavy' workload may not necessarily reflect being overwhelmed, but rather their involvement in more complex surgical cases or leadership responsibilities. These

characteristics could naturally correlate with higher SSC compliance, influencing the observed positive relationship between workload and SSC implementation.

5. CONCLUSION

This research yields three main points. First, the majority of nurses were in the light workload category, some were moderate, and only a few were heavy, with none in the 'not workload' category; this is likely influenced by long work experience. Second, SSC implementation was mostly good, although there were still small groups with fairly good to poor compliance, thus requiring more attention. Third, there is a significant positive relationship between workload and SSC implementation (r_s = 0.549; p = 0.034), which indicates that a high workload can actually increase SSC compliance when supported by experience, motivation, and a safety culture in the IBS.

Management of Nahdlatul Ulama Islamic Hospital (RSI NU) Demak hopes to conduct regular monitoring, workload evaluation, and fair distribution of human resources to prevent fatigue and maintain the quality of SSC application. Head of the IBS Room: optimize training, briefing, and disciplinary supervision at each SSC phase (Sign In, Time Out, Sign Out) to maintain consistency even under high workload. Future Researchers: it is recommended to use direct observation methods to assess SSC implementation, add variables such as knowledge, attitude, leadership, and intraoperative communication, and combine quantitative-qualitative approaches to obtain a more comprehensive picture.

CONFLICT OF INTEREST

FUNDING

DATA AVAILABILITY

Supplemental data will be provided upon request.

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