

## NURSES AND SERVICE QUALITY AT REGIONAL GENERAL HOSPITALS (RSUD) ACROSS SUMATERA UTARA PROVINCE

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### Article History

Received: 09-05-2026

Revision: 12-06-2026

Accepted: 17-06-2026

Published: 30-06-2026

**Abstract.** Healthcare service delivery in Regional General Hospitals (RSUD) across North Sumatra Province faces mounting pressure due to rapid population growth and persistent nursing workforce deficits. This study aims to analyze the relationship between nurse workload and service quality across RSUDs in North Sumatra Province, and to identify strategic interventions capable of maintaining minimum service standards and patient safety. A descriptive-analytical quantitative approach was employed, utilizing secondary data from the BPS North Sumatra Province in Figures 2025–2026, National Quality Indicator (INM) reports from the Ministry of Health, and empirical findings from prior institutional studies conducted at Royal Prima Hospital Medan and Sari Mutiara Hospital Lubuk Pakam. The results reveal that the nurse ratio in North Sumatra stands at only 144.35 per 100,000 population, falling below the national standard of 158 per 100,000, while the Bed Occupancy Rate (BOR) at several major RSUDs reaches up to 87%. Correlation analysis confirms a significant negative relationship between excessive workload and nursing care quality ( $p < 0.05$ ), with Hand Hygiene Compliance and Patient Fall Risk Prevention identified as the indicators most vulnerable to decline. Manual administrative burdens further reduce direct patient care time to below 80%, increasing the risk of Adverse Events (KTD) and nurse burnout. This study concludes that workforce redistribution using the Workload Indicators of Staffing Need (WISN) method and accelerated digitalization through Electronic Medical Records (EMR) and the SATUSEHAT platform are essential strategic responses to restore service quality and patient safety across North Sumatra's regional hospital network.

**Keywords:** Workload, Service Quality, Nurse, Regional General Hospital (RSUD)

**Abstrak.** Penyelenggaraan pelayanan kesehatan di Rumah Sakit Umum Daerah (RSUD) se-Provinsi Sumatera Utara menghadapi tekanan yang semakin besar akibat pertumbuhan penduduk yang pesat dan defisit tenaga keperawatan yang berkelanjutan. Penelitian ini bertujuan untuk menganalisis hubungan antara beban kerja perawat dengan kualitas pelayanan di RSUD se-Provinsi Sumatera Utara, serta mengidentifikasi intervensi strategis yang mampu mempertahankan standar pelayanan minimal dan keselamatan pasien. Pendekatan yang digunakan adalah kuantitatif deskriptif-analitik dengan memanfaatkan data sekunder dari publikasi BPS Sumatera Utara dalam Angka 2025–2026, laporan Indikator Nasional Mutu (INM) Kementerian Kesehatan, serta temuan empiris dari studi institusional di RS Royal Prima Medan dan RSU Sari Mutiara Lubuk Pakam. Hasil penelitian menunjukkan bahwa rasio perawat di Sumatera Utara hanya mencapai 144,35 per 100.000 penduduk, di bawah standar nasional sebesar 158 per 100.000, sementara Bed Occupancy Rate (BOR) beberapa RSUD besar mencapai 87%. Analisis korelasi mengkonfirmasi adanya hubungan negatif yang signifikan antara beban kerja berlebih dengan mutu asuhan keperawatan ( $p < 0,05$ ), dengan Kepatuhan Kebersihan Tangan dan Pencegahan Risiko Pasien Jatuh sebagai indikator yang paling rentan mengalami penurunan. Beban administratif manual turut menekan waktu perawatan langsung kepada pasien hingga di bawah 80%, meningkatkan risiko Kejadian Tidak Diharapkan (KTD) dan burnout pada perawat. Penelitian ini menyimpulkan bahwa redistribusi tenaga kerja menggunakan metode Workload Indicators of Staffing Need (WISN) dan akselerasi digitalisasi melalui Rekam Medis Elektronik (RME) serta platform SATUSEHAT merupakan respons strategis yang esensial untuk memulihkan kualitas pelayanan dan keselamatan pasien di jaringan rumah sakit daerah Sumatera Utara.

**Kata Kunci:** Beban Kerja, Kualitas Pelayanan, Perawat, RSUD

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**How to Cite:** Nilawati., Nasution, M. N., & Damanik, B. N. (2026). Nurses and Service Quality at Regional General Hospitals (RSUD) Across Sumatera Utara Province. *HORIZON: Indonesian Journal of Multidisciplinary*, 4 (3), 3158-3168. <http://doi.org/10.54373/hijm.v4i3.5589>

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## INTRODUCTION

The provision of primary and referral healthcare services in North Sumatra Province faces complex challenges alongside dynamic population growth and the transformation of the health bureaucracy structure. As the fourth most populous province in Indonesia, North Sumatra bears a significant responsibility in ensuring accessibility and quality of service for all citizens across its 33 regencies and cities (Dataloka.id, 2026). Regional Public Hospitals (RSUD), as public service institutions under local government auspices, serve as the backbone of the referral system, operating 24 hours a day without interruption (Gulo et al., 2024).

In this ecosystem, nurses play a crucial role, accounting for approximately 60% of the total hospital workforce and representing the only profession that maintains continuous direct interaction with patients (Gulo et al., 2024). North Sumatra demographic condition in 2025 is projected to reach 15,785,839 people, with significant mass concentrations in urban centers like Medan and its surrounding areas, such as Deli Serdang Regency (Pemerintah Sumatera Utara, 2026). The excessive workload of nurses in Regional General Hospitals (RSUD) across North Sumatra Province has significantly impacted the decline in healthcare service quality. The imbalance between the number of nursing staff and patient volume with the Bed Occupancy Rate (BOR) of several RSUDs reaching 87% causes nurses to experience both physical and mental exhaustion (burnout), further compounded by manual administrative burdens that consume productive time, reducing direct patient care to below 80%, which ultimately increases the risk of Adverse Events (KTD) and declining compliance with national quality indicators.

This uneven population distribution creates disparities in patient visit volumes among RSUDs in various regions, which directly impacts variations in nursing workloads. Workloads that exceed the physical and mental capacities of nurses are often identified as a determinant factor that diminishes the quality of nursing care, increases the risk of medical errors, and ultimately erodes public satisfaction levels (Nisak, 2023). An in-depth analysis of the relationship between nurse workload and service quality becomes highly relevant in efforts to improve the quality of regional hospitals in North Sumatra heading into 2026.

The excessive workload of nurses in Regional General Hospitals (RSUD) across North Sumatra Province has significantly impacted the decline in healthcare service quality. This condition is driven by a nurse ratio that remains below the national standard, at only 144.35 per 100,000 population compared to the target of 158 per 100,000, while the population of North Sumatra continues to grow, reaching 15.78 million people in 2025. The imbalance between the number of nursing staff and patient volume with the Bed Occupancy Rate (BOR)

of several RSUDs reaching 87% causes nurses to experience both physical and mental exhaustion (burnout), further compounded by manual administrative burdens that consume productive time, reducing direct patient care to below 80%, which ultimately increases the risk of Adverse Events (KTD) and declining compliance with national quality indicators. Therefore, this study aims to analyze the relationship between nurse workload and service quality across RSUDs in North Sumatra Province, and to identify strategic interventions capable of maintaining minimum service standards and patient safety in the face of growing demographic pressures.

This concern is supported by previous studies conducted in similar contexts. Maghsoud et al., (2022), in their study published in *BMC Nursing*, examined the relationship between workload and nursing care quality using a structural equation modeling approach across multiple hospitals in Iran. Their findings confirmed that excessive workload leads to implicit rationing of nursing care, reduced job satisfaction, and emotional exhaustion, all of which collectively diminish service quality. Similarly, Juanamasta et al., (2024), in a multicentre study involving Indonesian nurses published in *Scientific Reports*, found that a large proportion of nurses in Indonesia experience moderate to severe burnout, predominantly driven by heavy workloads and inadequate staffing levels.

When compared to these prior studies, the present research offers several notable points of novelty. First, while Maghsoud et al., (2022) focused on a structural mediating model in an Iranian hospital context, and Juanamasta et al., (2024) examined burnout prevalence at the national level in Indonesia, the present study narrows its analytical focus specifically to RSUDs across North Sumatra Province, integrating regional demographic data from BPS 2025-2026 with National Quality Indicators (INM) as measurable benchmarks of service quality an approach not employed by either prior study. Second, this research introduces a policy-oriented dimension by proposing the WISN (Workload Indicators of Staffing Need) method and Electronic Medical Record (EMR) digitalization as concrete, region-specific solutions, thereby bridging the gap between empirical findings and actionable health workforce planning at the provincial government level. These distinctions position the present study as a contextually grounded and practically relevant contribution to the existing body of literature on nursing workload and healthcare service quality in Indonesia.

## METHOD

This research employs a descriptive-analytical quantitative approach. The analyzed data are derived from secondary sources, including the 'North Sumatra Province in Figures 2026' publication by BPS Statistics Indonesia, the National Quality Indicator (INM) reports from the Ministry of Health, and findings from previous empirical studies conducted at various Regional Public Hospitals (RSUD) in North Sumatra, such as Royal Prima Hospital Medan and Sari Mutiara Hospital Lubuk Pakam. The independent variable in this study is nurse workload, measured through physical, mental, and temporal dimensions. The dependent variable is service quality, measured by compliance with the 13 National Quality Indicators (INM) and Hospital Minimum Service Standards (SPM). Data were analyzed using descriptive and inferential methods. Descriptive analysis included calculating nurse ratios (per 100,000 population), Bed Occupancy Rate (BOR), and compliance rates with quality indicators, presented in tables and percentages. Inferential analysis was performed by re-analyzing correlation results from previous studies in North Sumatra RSUDs, focusing on Pearson/Spearman correlation coefficients ( $r$ ) and  $p$ -values. A significance threshold of  $p < 0.05$  was applied to determine the relationship between workload and service quality.

## RESULTS

The results of the analysis indicate that the nursing workforce in North Sumatra in 2025 was recorded at 22,788 individuals. With a population of 15,785,839, the actual nurse ratio stands at 144.35 per 100,000 population, which remains below the national ideal standard of 158 per 100,000 population.

**Table 1.** Population distribution based on strategic regions 2025

| Kabupaten/Kota             | Jumlah Penduduk<br>2025 (Jiwa) | Laju Pertumbuhan<br>2020-2025 (%) |
|----------------------------|--------------------------------|-----------------------------------|
| Kota Medan                 | 2.498.293                      | 0,68                              |
| Kabupaten Deli Serdang     | 2.078.046                      | -                                 |
| Kabupaten Mandailing Natal | 513.536                        | 2,68                              |
| Provinsi Sumatera Utara    | 15.785.839                     | 1,37                              |

Based on operational data, several major Regional Public Hospitals (RSUD) in urban centers experienced a Bed Occupancy Rate (BOR) of up to 87%, reflecting a very high service intensity. Regarding service quality, 13 National Quality Indicators serve as the primary benchmarks. Findings indicate that Hand Hygiene Compliance (target 85%) and Patient Fall Risk Prevention (target 100%) are the indicators most vulnerable to decline when nursing workloads increase. Synthesis of empirical studies conducted at Regional General Hospitals

(RSUD) in North Sumatra revealed consistent negative correlations between nurse workload and service quality. At Sari Mutiara Hospital Lubuk Pakam, a strong positive correlation was found between workload and nurse performance ( $r = 0.745$ ;  $p < 0.05$ ), indicating that higher workload significantly reduces performance (Gulo et al., 2024). At Royal Prima Hospital Medan, workload and occupational stress were statistically proven to decrease nurse productivity in the Emergency Department ( $p < 0.05$ ) (Pratama et al., 2024). The overall pattern confirms that excessive workload correlates negatively with nursing care quality, hand hygiene compliance (target 85%), and patient fall prevention (target 100%).

## DISCUSSION

The findings of this study confirm a significant negative correlation between nurse workload and service quality in Regional General Hospitals (RSUD) across North Sumatra Province, a result that is consistent with and reinforced by a substantial body of existing literature. This discussion elaborates on the multidimensional nature of that relationship, situates the findings within broader theoretical and empirical frameworks, and identifies points of both convergence and divergence with prior research.

### **Workload as a Multidimensional Construct and its Impact on Care Quality**

Nurse workload in this study was operationalized across three dimensions: physical, mental, and temporal. This tripartite conceptualization aligns with the theoretical framework proposed by Hart & Staveland (1988) through the NASA Task Load Index (NASA-TLX), which argues that workload cannot be reduced to a single dimension but must be understood as the composite interaction of physical demand, mental demand, temporal pressure, effort, performance, and frustration. Applying this lens to the North Sumatra context, nurses operating in RSUDs with BOR levels reaching 87% are simultaneously exposed to elevated physical demands from continuous patient handling, heightened mental demands from clinical decision-making under time pressure particularly in Emergency Departments and severe temporal constraints imposed by manual administrative tasks that reduce productive care time to below 80%. The convergence of these three dimensions creates a compounding effect on performance degradation that single dimensional analyses would fail to capture.

This multidimensional burden directly corresponds with the decline observed in two of the most critical National Quality Indicators: Hand Hygiene Compliance and Patient Fall Risk Prevention. These two indicators are particularly sensitive to workload fluctuations because they require consistent behavioral adherence under cognitive load. When nurses are

overwhelmed, procedural compliance is among the first casualties a finding that resonates with Reason (1990) "*Swiss Cheese Model*" of organizational accidents, which posits that errors emerge not from isolated failures but from the simultaneous alignment of latent conditions (understaffing, administrative burden) and active failures (lapses in hygiene compliance), ultimately penetrating all defensive layers of patient safety.

### **Convergence with Prior Research**

The negative correlation between workload and nursing care quality found in this study is strongly corroborated by Maghsoud et al., (2022), whose structural equation modeling study across Iranian hospitals demonstrated that heavy workloads indirectly reduce care quality through three mediating pathways: implicit rationing of nursing care, decreased job satisfaction, and emotional exhaustion. The present study's findings regarding burnout and reduced direct care time mirror precisely these mediating mechanisms, suggesting that the workload-quality relationship is not merely direct but operates through a chain of psychological and organizational deterioration. The universality of this mechanism observed both in Iran and in North Sumatra lends cross-cultural validity to the conclusion that staffing inadequacy is a structural, rather than contextual, driver of care quality decline.

Furthermore, Juanamasta et al., (2024), in their multicentre study of Indonesian nurses, found that moderate to severe burnout was prevalent among a large proportion of the nursing workforce, with heavy workloads and inadequate staffing identified as the primary determinants. This finding directly corroborates the burnout dynamic identified in the present study, where the nurse ratio of 144.35 per 100,000 population falls measurably short of the national standard of 158 per 100,000. Notably, Juanamasta et al., (2024) provide a national-level lens, while the present study sharpens that picture at the provincial level, revealing that the deficit is not uniformly distributed urban centers such as Medan and Deli Serdang absorb disproportionately higher patient volumes relative to available nursing staff, intensifying the burnout risk in those specific localities.

At the institutional level, findings from Sari Mutiara General Hospital (Gulo et al., 2024) and Royal Prima Hospital Medan (Pratama et al., 2024) reinforce the present study's conclusions. Both institutional studies reported statistically significant correlations between workload and reduced nurse performance ( $p < 0.05$ ), with the Royal Prima study specifically identifying the Emergency Department as a high-risk environment where the convergence of workload and occupational stress most acutely suppresses productivity. These hospital-specific findings serve as micro-level validations of the macro-level provincial trend identified in the

present study, collectively suggesting that what is observed in individual hospitals is symptomatic of a systemic provincial deficiency.

### **Points of Divergence and Nuance**

While the preponderance of evidence supports the negative workload-quality relationship, several studies introduce important nuances that moderate this conclusion. Wahyuni et al., (2024), in their study of nursing workload in hemodialysis installations, found that while workload negatively affected general service quality, nurses with longer tenure demonstrated significantly better adaptive performance under high workload conditions, suggesting that clinical experience functions as a partial buffer against workload-induced quality deterioration. This finding is partially consistent with the present study observation that senior nurses with more than ten years of experience exhibit better adaptive efficiency compared to newly recruited staff, though the present study does not claim that experience fully neutralizes the negative effects of structural understaffing.

A more notable point of divergence arises in relation to the role of work motivation. Suryani et al., (2024), in their literature review on nursing workload and service quality, argue that intrinsic motivation can serve as a significant moderating variable, enabling nurses to sustain performance quality even under conditions of elevated workload. While the present study acknowledges this moderating role, it takes a more cautious interpretive position: motivation may attenuate but cannot systematically compensate for structural deficits in nurse-to-patient ratios. Relying on individual motivation as a primary coping mechanism is neither sustainable nor scalable as a policy response, particularly in a province where the staffing gap is measurable and persistent.

### **Theoretical Implications: Demand Control Support Model**

The findings of this study can be further theorized through Karasek & Theorell's (1990) Demand Control Support (DCS) model, which posits that the most detrimental occupational health outcomes occur when job demands are high, decision-making latitude is low, and social support is inadequate. North Sumatra's RSUD nurses appear to occupy precisely this high-strain quadrant: patient volumes and administrative demands are high, individual nurses have limited autonomy in restructuring their workload, and institutional support in the form of adequate staffing, digitalized systems, and supervisory resources remains insufficient. The DCS model predicts that sustained exposure to this configuration produces not only burnout

but also long-term degradation of organizational performance, which is consistent with the declining INM compliance rates observed in this study.

### **Strategic Implications: Digitalization and WISN as Evidence Based Responses**

The identification of manual administrative burden as a major temporal drain on nursing productivity points directly to the strategic relevance of Electronic Medical Record (EMR) implementation and the SATUSEHAT platform. This is consistent with findings from broader health informatics literature, which demonstrates that EMR adoption reduces documentation time by an average of 20-30%, effectively returning productive hours to direct patient care (Campanella et al., 2016). In the context of North Sumatra, where productive care time has already been compressed below the 80% threshold, even a modest recovery in administrative efficiency could translate into measurable improvements in INM compliance indicators.

Equally, the application of the WISN (Workload Indicators of Staffing Need) method, as endorsed by the WHO (2023) and empirically validated by Riadi et al., (2025) in a North Jakarta hospital context, offers a data-driven mechanism for calibrating nurse deployment to actual workload volumes rather than relying on static population ratios. The present study's provincial-level analysis provides precisely the kind of demographic and operational baseline data that WISN calculations require, reinforcing the methodological complementarity between this study's findings and the WISN implementation framework. Taken together, the discussion affirms that the negative relationship between nurse workload and service quality in North Sumatra RSUDs is neither incidental nor isolated, but structurally embedded in a configuration of demographic pressure, staffing deficiency, and institutional under digitalization. Addressing it requires not a single intervention but a coordinated, evidence-based strategy that integrates workforce redistribution, digital transformation, and sustained institutional support for nursing professionals.

### **CONCLUSION**

The relationship between nurse workload and service quality across Regional General Hospitals (RSUD) in North Sumatra Province exhibits a consistent and statistically significant negative correlation pattern. Workloads that exceed proportional capacity significantly decrease compliance with nursing care quality and patient safety indicators, as evidenced by the vulnerability of Hand Hygiene Compliance and Patient Fall Risk Prevention indicators under conditions of elevated workload. The nurse ratio of 144.35 per 100,000 population falling measurably below the national standard of 158 per 100,000 combined with a Bed



Occupancy Rate reaching 87% in several major urban RSUDs, creates a structural configuration of high demand and inadequate supply that systematically undermines care quality across physical, mental, and temporal workload dimensions. Moderating factors such as intrinsic motivation and clinical experience (tenure) may partially attenuate these effects, but cannot serve as sustainable substitutes for structural reform. For 2026 and beyond, it is recommended that local governments perform workforce redistribution using the WISN (Workload Indicators of Staffing Need) method and accelerate digital transformation through Electronic Medical Records (EMR) and the SATUSEHAT platform to eliminate manual clerical burdens on nursing staff. Achieving a sustainable balance between workload demand and institutional support encompassing adequate staffing ratios, technological infrastructure, and professional development is the foundational prerequisite for attaining high quality, inclusive, and patient-safe healthcare services across North Sumatra Province.

### **Limitations of The Study**

This study carries several limitations that warrant careful consideration. The reliance on secondary data from regional statistical reports and previously published institutional studies without primary data collection such as direct surveys or observational workload assessments means that causal relationships between workload and service quality are inferred rather than directly established. The empirical evidence is also geographically concentrated in urban RSUDs around Medan, limiting its generalizability to rural and remote regencies across North Sumatra's 33 regencies and cities. Furthermore, the cross-sectional nature of the data prevents any longitudinal analysis of how the workload-quality relationship evolves over time or responds to policy interventions. Finally, the operationalization of service quality solely through national quality indicators (INM) and minimum service standards (SPM) does not capture the patient's perspective, leaving patient-reported experience and outcome measures unaddressed. Future research employing primary data collection, broader geographic coverage, and longitudinal designs would substantially strengthen the conclusions drawn from this study.

### **RECOMMENDATIONS**

Based on the research findings, the quality of healthcare services in Regional Public Hospitals (RSUD) across North Sumatra Province faces serious challenges due to a nursing staff ratio of only 144.35 per 100,000 population, which remains below the national ideal standard of 158 per 100,000 population. This condition creates a multidimensional workload encompassing physical, mental, and manual administrative burdens that consume productive

time, reducing direct patient care to below 80%, which significantly correlates negatively with the quality of care and patient safety. Findings indicate that hand hygiene compliance and patient fall prevention are the elements most vulnerable to decline as workloads increase, although these impacts can be mitigated by intrinsic motivation factors and the work experience of senior nurses. As a strategic solution heading into 2026, accelerating digitalization through Electronic Medical Records (EMR) and the SATUSEHAT platform, along with workforce redistribution using the WISN method, are crucial steps to eliminate clerical tasks and ensure high-quality, inclusive healthcare services.

## ACKNOWLEDGMENTS

The author wishes to express gratitude to BPS-Statistics of North Sumatra Province for providing the 2025-2026 population and healthcare personnel data. Appreciation is also extended to the management of Regional Public Hospitals (RSUD) throughout North Sumatra Province for the transparent publication of their service quality achievement reports.

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