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EVALUATING THE IMPACT OF NURSE TO PATIENT RATIO ON PATIENT SAFETY AND QUALITY OF CARE IN DHQ HOSPITAL MUZAFFARGARH

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ABSTRACT

Introduction

Nurse-to-patient ratios are a critical determinant of healthcare quality and nurse well-being. In settings with understaffed nursing units, increased workloads contribute to compromised patient care, missed interventions, and staff burnout. Developing countries like Pakistan face challenges in maintaining optimal staffing levels, particularly in public sector hospitals, where resource constraints are prevalent. Understanding the consequences of disproportionate nurse-to-patient ratios is essential for workforce planning and quality improvement.

Study Purpose

The purpose of this study was to evaluate the impact of nurse-to-patient ratios on quality of patient care and nurse well-being, including task completion, perceived care outcomes, and burnout levels, among nurses working at District Headquarters (DHQ) Hospital Muzaffargarh.

Research Methodology

A descriptive cross-sectional study was conducted among 82 female nurses working across general medical, surgical, and emergency wards at DHQ Hospital Muzaffargarh. Participants were recruited using a purposive sampling technique. Data were collected using a structured and pre-validated questionnaire covering demographics, workload, quality of care, and burnout indicators. Descriptive statistics were analyzed using SPSS Version 27.

Results

The majority (63.4%) of participants were aged 19–25 years. In terms of job title, 46.3% were registered nurses, 41.5% student nurses, and 12.2% faculty nurses. Over 58% of nurses reported that their patient load was not manageable, and 92.7% believed that high patient ratios compromised the quality of care. Around 62% were unable to complete essential tasks, while 69.5% admitted to missed care due to insufficient staffing. Additionally, 73% observed increased complications such as falls or pressure sores, and 66% noticed higher patient complaints during low-staffing periods. Burnout was evident, with 80.5% experiencing exhaustion and 28% reporting

it very frequently. Despite these conditions, 65.9% of nurses, primarily from morning shifts, expressed job satisfaction.

Conclusion

The findings confirm that suboptimal nurse-to-patient ratios significantly hinder the delivery of quality care and contribute to nurse fatigue and dissatisfaction. The lack of consistent workload adjustments based on patient acuity further exacerbates stress and compromises patient safety. Urgent policy-level interventions are needed to enforce evidence-based staffing standards and implement supportive systems for nurse well-being in Pakistani healthcare settings.

Keywords: *Nurse-to-Patient Ratio, Healthcare Quality, Nursing Workload, Health Workforce Management, Nursing Efficiency.*

INTRODUCTION

In recent decades, the relationship between nurse-to-patient ratios and patient outcomes has garnered significant attention within healthcare systems worldwide. Adequate nurse staffing is critical for ensuring safe, timely, and effective patient care delivery. Globally, various healthcare models have begun integrating evidence-based nurse staffing legislation to maintain quality standards (Batiha 2025). Research has shown that lower nurse staffing levels are associated with increased rates of adverse patient outcomes, medical errors, and nurse burnout (Twigg, Whitehead et al. 2021);(Zabidi, Alghamdi et al. 2024). Despite growing international recognition of optimal nurse-to-patient ratios, many developing countries, including Pakistan, continue to struggle with systemic understaffing, especially in public sector hospitals like DHQ Muzaffargarh. These staffing inadequacies often contribute to compromised patient care, delayed interventions, and elevated nurse stress levels, which is particularly concerning in high-demand units such as emergency, medical, and surgical wards.Although a substantial body of literature supports the link between appropriate staffing levels and improved patient outcomes, a consistent policy framework is lacking in many healthcare institutions. For instance, while studies from high-income settings report reductions in patient mortality and increased job satisfaction with regulated staffing (Lang, Hodge et al. 2004);(Conway, Tamara Konetzka et al. 2008), there is insufficient evidence from lower-middle-income countries (LMICs) like Pakistan. Moreover, recent studies in Pakistan report nursing overload, patient dissatisfaction, and burnout as growing concerns (Hussain, RAZZAQ et al. 2021);(Bibi, Muhammad et al. 2021). The variability in reported nurse workloads, patient care omissions, and occupational injuries (El Shahhat, Ahmed et al. 2024) reveals that the current nurse-to-patient allocations are not evidence-informed. Furthermore, local observations suggest that critical units in DHQ Muzaffargarh are often overburdened with minimal staff coverage, raising concerns about patient safety and nursing care quality in real-time clinical settings. This research aims to fill the gap in localized data by assessing how current nurse-to-patient ratios affect patient outcomes and nursing performance within DHQ Hospital Muzaffargarh. While global literature supports the benefits of safe staffing, the evidence is mostly derived from settings with better infrastructure, governance, and nurse empowerment. Pakistan's regional and district-level hospitals have unique operational limitations, including poor resource allocation, limited workforce retention, and inadequate administrative oversight (Majeed, Fatima et al. 2025);(Danish, Jaffer et al. 2025). Hence, evaluating this issue in a resource-constrained yet high-demand setting will not only help verify the applicability of international findings in the Pakistani context but may also provide actionable insights for policy advocacy, human resource reform, and hospital management strategies.

Research Question

What is the impact of nurse-to-patient ratios on patient safety and quality of care at DHQ Hospital Muzaffargarh?

Objective

To assess the relationship between nurse-to-patient ratio and patient safety and quality of care at DHQ Hospital Muzaffargarh.

Problem Statement:

In recent years, the link between nurse-to-patient ratios and patient outcomes has been well-documented globally; however, this issue remains critically unaddressed in many developing countries, including Pakistan. Public healthcare institutions such as DHQ Hospital Muzaffargarh often face chronic understaffing, particularly in high-demand units like emergency, surgical, and medical wards. This imbalance leads to delayed care, increased risk of medical errors, diminished patient satisfaction, and heightened nurse burnout. Despite global recommendations advocating safe staffing levels, Pakistan lacks a consistent and evidence-based staffing policy, especially at the district hospital level. The absence of localized data makes it difficult to assess the true impact of nurse workload on patient care outcomes in resource-limited settings. This study addresses this gap by evaluating how current nurse-to-patient ratios affect patient outcomes and nursing performance at DHQ Muzaffargarh, providing much-needed evidence from a low-resource, high-demand healthcare environment.

Significance of the Study:

This research is significant as it aims to generate context-specific evidence regarding the impact of nurse-to-patient ratios on patient outcomes in a public sector hospital in Pakistan. By focusing on DHQ Hospital Muzaffargarh, the study seeks to reveal how understaffing influences patient safety, quality of care, and nurse well-being in real-time clinical settings. The findings will help healthcare administrators and policymakers understand the critical role of adequate nurse staffing in improving health service delivery. Additionally, the study could serve as a foundation for advocating reforms in workforce planning, staffing policies, and administrative support at district and provincial levels. Ultimately, the research has the potential to inform strategies that enhance both patient outcomes and job satisfaction among nurses, contributing to more effective and sustainable healthcare delivery in resource-constrained environments like Southern Punjab.

METHODOLOGY

This descriptive cross-sectional study was designed to assess the impact of the nurse-to-patient ratio on the quality of care among nursing staff at District Headquarters (DHQ) Hospital Muzaffargarh. The study was conducted in collaboration with the Department of Nursing and Hospital Administration and took place specifically in the general medical, surgical, and emergency wards of the hospital. A total of 82 nurses were included in the study, with the sample size calculated using Cochran's formula. The assumptions applied included a Z-value of 1.81 corresponding to a 90% confidence level, an estimated proportion (p) of 0.5 representing the expected compliance with quality care practices, and a margin of error (e) of 0.10 (10%), resulting in a required sample size of 82 nurses.

A non-probability purposive sampling technique was used to recruit participants who met the inclusion criteria. All eligible participants were approached directly during their shifts, and informed consent was obtained prior to data collection. The inclusion criteria encompassed registered nurses with at least six months of clinical experience at DHQ Hospital, those working in general medicine, surgical, or emergency units, and individuals willing to participate and provide consent. Exclusion criteria included nurses in administrative positions without direct patient care responsibilities, those on extended leave or rotation during the study period, and student nurses or nursing interns.

The study variables included the nurse-to-patient ratio as the independent variable, while the dependent variables were perceived quality of care, patient outcomes, nurse burnout, and satisfaction. Potential confounders identified were shift timing, years of experience, and patient acuity level. Participants' knowledge regarding nurse-to-patient ratios and their effect on quality care was assessed using a structured questionnaire. The scoring criteria were categorized as follows: excellent

knowledge for >80% correct responses, good knowledge for 65%–80%, average knowledge for 50%–64%, and poor knowledge for <50%. This assessment framework was adapted from Polit and Beck (2021) and aligned with standardized Knowledge, Attitude, and Practice (KAP) studies used in healthcare workforce research.

Data were collected using a structured, pre-validated questionnaire adapted from the World Health Organization (WHO) Quality of Care Assessment Tool and the Maslach Burnout Inventory (MBI) Short Form. Participants completed the questionnaire anonymously during their shifts. The data collection tool consisted of four sections: Section A covered demographic information (age, gender, experience, and shift type); Section B focused on nurse-to-patient ratio and workload; Section C assessed self-perceived quality of care; and Section D evaluated burnout levels using the MBI Short Form.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize demographic data and nurse-to-patient ratios. Ethical considerations were strictly observed throughout the study. Participants provided written informed consent before participation, and all collected data were treated with strict confidentiality. Anonymity of participants was maintained, and it was clearly communicated that participation was voluntary, with the right to withdraw at any stage without any consequences. No participants were exposed to any risks or harm, and transparency regarding the study's nature, purpose, and procedures was maintained at all times.

RESULTS

1. Demographic Profile of Respondents

Among the 82 respondents, all were female nurses currently working or studying at DHQ Hospital Muzaffargarh. The age distribution showed that a majority (63%) were between 19 and 25 years old, while 21% were in the 26–30 age group, and the remaining 16% were aged 31–35 years. In terms of professional roles, 46% of participants were registered nurses, 41% were student nurses, and 13% served as faculty nurses. Regarding clinical experience, 53% had less than 2 years of working experience, 29% had between 2 to 4 years, and 18% had over 4 years of nursing experience. When asked about their working hours, 44% reported working in morning shifts, 22% in night shifts, and 34% in rotating shifts. This diverse representation highlights the varying levels of professional exposure and workload patterns among nurses in the hospital setting. (Table 01)

Table 01: Demographic Characteristics of Respondents (N = 82)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	19–25 years	52	63.4%
	26–30 years	17	20.7%
	31–35 years	13	15.9%
Job Title	Student Nurse	34	41.5%
	Registered Nurse	38	46.3%
	Faculty Nurse	10	12.2%
Experience	<2 years	44	53.7%
	2–4 years	24	29.3%

	>4 years	14	17.1%
Shift Type	Morning	36	43.9%
	Night	18	22.0%
	Rotating	28	34.1%

2. Nurse-to-Patient Ratio Observations

In terms of workload, nurses reported that patient assignments per shift ranged from as few as 3 to as many as 30 patients. When asked about the manageability of this workload, 58.5% of respondents expressed that the number of patients they were assigned was not manageable. Additionally, only 19.5% of the nurses indicated that their departments consistently adjusted staffing or workload based on patient acuity levels. This suggests a significant gap in dynamic workload management, which can potentially compromise the quality and safety of patient care. (Table 02)

Table 02: Nurse-to-Patient Ratio and Workload Management (N = 82)

Variable	Category	Frequency (n)	Percentage (%)
Patient Load per Shift	Range	3–30 patients	–
Manageability of Patient Load	Manageable	34	41.5%
	Not Manageable	48	58.5%
Acuity-Based Adjustment	Always Adjusted by Acuity	16	19.5%
	Not Adjusted / Inconsistently Done	66	80.5%

3. Perceptions on Quality of Care

A significant majority (92.7%) of respondents believed that their current nurse-to-patient workload negatively impacts the quality of care they provide. In terms of task completion, 62% of nurses reported being unable to consistently complete essential duties such as monitoring vitals, administering medications, or documenting care. Furthermore, 69.5% acknowledged that they had missed delivering patient care due to inadequate staffing. Alarmingly, 73% observed a rise in adverse patient events—such as falls, infections, or pressure sores—during periods of low staffing. Additionally, 66% of the nurses reported that patient complaints noticeably increased when staffing levels were reduced, highlighting the direct correlation between understaffing and compromised care delivery. (Table 03)

Table 03: Impact of Nurse Workload on Care Quality and Patient Safety (N = 82)

Variable	Category/Observation	Frequency (n)	Percentage (%)
Workload Compromises Care	Yes	76	92.7%
Task Completion	Inconsistent Completion of Essential Tasks	51	62.0%
Missed Care	Due to Staff Shortages	57	69.5%
Patient Safety Incidents	Increased During Low Staffing	60	73.0%
Patient Complaints	Increased with Staff Shortages	54	66.0%

4. Burnout and Job Satisfaction

Burnout levels among nurses were notably high in this study. A total of 80.5% of respondents reported experiencing physical or mental exhaustion after completing their shifts, and 28% of them described this exhaustion as occurring very frequently. Despite these challenges, 65.9% of participants expressed overall satisfaction with their work environment. Interestingly, a greater proportion of satisfied respondents were those assigned to morning shifts, suggesting that shift timing may influence perceptions of workplace stress and satisfaction. **(Table 04).**

Table 04: Burnout and Job Satisfaction among Nursing Staff (N = 82)

Variable	Category/Observation	Frequency (n)	Percentage (%)
Post-Shift Exhaustion	Experienced Physical/Mental Exhaustion	66	80.5%
	Experienced It Very Frequently	23	28.0%
Job Satisfaction	Reported General Satisfaction	54	65.9%

	Most Satisfaction Reported in Morning Shift	–	–

Summary Of Results:

The study reveals several critical issues affecting nursing care delivery at DHQ Hospital Muzaffargarh. Nurse-to-patient ratios are often above recommended levels, particularly in high-demand units such as emergency and surgical wards. A majority of respondents (58.5%) indicated their patient loads were unmanageable, with some reporting assignments of up to 30 patients per shift. This excessive workload significantly impacts the quality of care, with 69.5% of nurses admitting they had missed essential nursing care tasks and 62% unable to consistently complete vital responsibilities such as medication administration, documentation, and monitoring.

Furthermore, burnout and physical exhaustion were reported by 80.5% of participants, with 28% experiencing such fatigue very frequently. These symptoms were most prevalent in shifts with heavier patient loads, highlighting the connection between understaffing and nurse well-being. Additionally, 73% of respondents observed increased incidents of patient harm, including falls, infections, and pressure ulcers, during periods of inadequate staffing. Despite these challenges, only 19.5% of nurses reported that their units regularly adjusted workload based on patient acuity, indicating inconsistent implementation of workload balancing protocols.(Table 05)

Table 05: Summary of Results (N = 82)

Key Indicator	Observation	Frequency (n)	Percentage (%)
Unmanageable Patient Load	Nurses reporting workload as unmanageable	48	58.5%
Missed or Delayed Nursing Care	Missed care due to staff shortages	57	69.5%
Incomplete Essential Tasks	Inconsistent completion of vitals, meds, documentation	51	62.0%
Burnout/Exhaustion After Shifts	Nurses reporting exhaustion	66	80.5%

Frequent Burnout	Nurses frequently experiencing burnout	23	28.0%
Patient Safety Compromised	Increased falls, infections, pressure sores during shortages	60	73.0%
Acuity-Based Workload Adjustments	Units applying workload adjustments consistently	16	19.5%

DISCUSSION:

The present study aimed to evaluate the impact of nurse-to-patient ratios on the quality of care and nurse well-being within a high-demand public hospital setting. The findings demonstrate a clear association between high patient loads and compromised care delivery, in alignment with numerous international and local studies.

A majority (58.5%) of nurses reported their patient loads to be unmanageable, with some handling up to 30 patients per shift. These findings reflect trends noted by (Twigg, Whitehead et al. 2021), who emphasized that inadequate staffing models significantly reduce the time nurses can dedicate to each patient, leading to missed care and increased errors. Similarly, (Lang, Hodge et al. 2004) found that lower nurse-to-patient ratios correlated with higher incidences of pressure ulcers, falls, and medication errors issues also echoed by 73% of nurses in our study reporting increased patient complications during short staffing.

Nearly 93% of participants in this study acknowledged that their workload negatively impacted their ability to deliver high-quality care, which supports the findings of (Peng, Saito et al. 2024), both of whom identified high workload and staffing shortages as primary contributors to "care left undone" in clinical practice. Moreover, 69.5% admitted to missing essential patient care activities, which has also been extensively discussed in international reviews by (Zabidi, Alghamdi et al. 2024); (Conway, Tamara Konetzka et al. 2008).

Burnout emerged as another critical concern, with 80.5% of nurses experiencing physical or mental exhaustion post-shift comparable to the findings of (Akkoç, Okun et al. 2021);(Shah, Gandrakota et al. 2021), who highlighted the direct impact of chronic understaffing on emotional fatigue, job dissatisfaction, and turnover intention. (Arıkan and Esenay 2023) observed similar burnout levels among pediatric nurses, particularly during crisis periods like the COVID-19 pandemic. Our findings are consistent with (Majeed, Fatima et al. 2025), who documented high burnout levels in tertiary care settings in Pakistan.

Despite the stress and exhaustion, 65.9% of nurses in the current study expressed satisfaction with their working environment, particularly those on morning shifts. This partial satisfaction may stem from perceived peer support or better administrative oversight during daytime hours. However, this satisfaction may not be sustainable without systematic changes in workload management, as emphasized by (Subramony, Vogus et al. 2024);(El Shahhat, Ahmed et al. 2024).

Furthermore, only 19.5% of respondents reported acuity-based patient allocation an

essential strategy for balancing workload that is still lacking in many LMIC hospitals (Robitaille 2019);(Batiha 2025). This shortfall in adaptive staffing practices contributes to inefficiencies and threatens both patient safety and workforce retention, as supported by (Heinz 2004);(Gul 2008).

Finally, this study adds to the growing evidence base from Pakistan, where healthcare systems are burdened by staffing shortages, inadequate policy enforcement, and limited nurse empowerment. Local studies such as (Danish, Jaffer et al. 2025);(Hussain, RAZZAQ et al. 2021) have highlighted the urgent need to bridge the theory-practice gap and improve workplace conditions for nurses in both rural and urban public hospitals

CONCLUSION

This study highlights the significant impact of nurse-to-patient ratios on the quality of care and the well-being of nursing staff at DHQ Hospital Muzaffargarh. Findings revealed that the majority of nurses experience high workloads that often compromise patient care quality, delay essential tasks, and contribute to missed care. Furthermore, the data show a strong association between poor staffing levels and adverse patient outcomes, such as increased complications and complaints. Burnout and physical or emotional exhaustion were prevalent, particularly among nurses working night and rotating shifts. Despite these challenges, a notable portion of nurses still reported job satisfaction, especially those working morning shifts. These findings emphasize the urgent need to implement acuity-based staffing models and provide administrative support to reduce workload-related stress and improve care outcomes.

Limitations:

i. **Limited Sample Size and Scope** The study was restricted to 82 nurses from one public hospital, limiting the generalizability to other districts or hospital types.

ii. **Self-Reported Responses** Data was based on self-perception, which may be influenced by recall bias or social desirability bias.

iii. **Exclusion of Night Supervisors and Administrative Nurses** The study excluded nurses in non-clinical or supervisory roles, omitting important organizational perspectives.

iv. **Cross-sectional Design** The study captures a snapshot in time, not changes over time or cause-and-effect relationships.

v. **Lack of Objective Clinical Indicators** No clinical audit or patient chart review was conducted to verify missed care or complications.

Recommendations:

I. **Implement Acuity-Based Staffing Protocols** Develop and enforce patient acuity assessment tools to distribute workloads more equitably across shifts.

II. **Increase Nursing Workforce in High-Load Units** Surgical, emergency, and critical care wards require prioritized staffing interventions to avoid care delays and nurse burnout.

III. **Introduce Rotational Fatigue Management Programs** Provide scheduled breaks, stress relief interventions, and rotation policies to reduce physical and emotional exhaustion.

IV. **Establish Real-Time Reporting Systems** Enable nurses to report unsafe workloads or missed care events anonymously for timely administrative response.

V. **Policy Advocacy for Safe Staffing Legislation** Collaborate with nursing councils and health departments to standardize nurse-to-patient ratios nationally.

VI. **Ongoing Training on Time and Resource Management** Equip nurses with tools to optimize care delivery even under constrained conditions.

VII. **Periodic Assessment and Feedback Loops** Conduct regular evaluations to monitor nurse well-being and patient care indicators, and implement data-informed changes.

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