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Assessment of Nursing Care Quality and Its Association with Clinical Outcomes Among Hospitalized Patients: A Cross-Sectional Study from Arar, Saudi Arabia

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ABSTRACT: ***Background:*** Nursing care quality is a critical determinant of patient safety and clinical outcomes in hospital settings. However, empirical evidence linking patient-perceived nursing care quality to objective clinical outcomes in Saudi Arabian hospitals remains limited, particularly in the Northern Border region.

Objective: To assess the level of nursing care quality as perceived by hospitalised patients and to examine its association with selected clinical outcomes, including hospital-acquired infections, length of stay, and in-hospital mortality.

Methods: A cross-sectional, correlational design was employed among 48 hospitalised adult patients admitted to the medical-surgical wards of a tertiary care hospital affiliated with the College of Nursing, Northern Border University, Arar, Saudi Arabia, between April 2022 and December 2022. Nursing care quality was measured using the Arabic version of the Patient Satisfaction with Nursing Care Quality Questionnaire (PSNCQQ). Clinical outcome data were extracted from medical records. Descriptive statistics, Pearson correlation, and logistic regression were used for analysis.

Results: The mean overall PSNCQQ score was 3.89 ± 0.62 on a 5-point scale. Hospital-acquired infections occurred in 12.5% of patients (n = 6), the mean length of stay was 7.4 ± 3.8 days, and in-hospital mortality was 4.2% (n = 2). Higher PSNCQQ scores were significantly associated with shorter length of stay ($r = -0.41$, $p = 0.004$) and lower odds of hospital-acquired infection (OR = 0.32, 95% CI: 0.12–0.87, $p = 0.025$).

Conclusion: Patient-perceived nursing care quality was significantly associated with favourable clinical outcomes. Strengthening nursing care processes in Saudi hospitals may contribute to reduced infection rates and shorter hospital stays.

Keywords: nursing care quality, clinical outcomes, patient satisfaction, hospital-acquired infection, length of stay, Saudi Arabia, PSNCQQ

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INTRODUCTION

The quality of nursing care is widely recognised as a cornerstone of patient safety and the overall effectiveness of hospital services [1,2]. Nursing care quality encompasses technical competence, interpersonal communication, responsiveness, and the provision of a safe care environment [1,3]. In recent years, the global discourse on healthcare quality has increasingly emphasised patient-centred metrics, with patient satisfaction with nursing care emerging as a key indicator of healthcare quality that correlates with clinical processes and outcomes [3,4]. The Kingdom of Saudi Arabia has invested substantially in healthcare infrastructure and quality improvement initiatives under Vision 2030, yet empirical evidence on nursing care quality and its downstream effects on patient outcomes within Saudi hospital settings remains uneven, particularly in the Northern Border region [5,6].

A substantial body of international evidence demonstrates that deficiencies in nursing care quality, including missed or rationed nursing care, are associated with adverse patient outcomes such as increased rates of hospital-acquired infections, prolonged length of stay, higher readmission rates, and elevated mortality [2,4]. Chaboyer et al. systematically reviewed the outcomes of missed nursing care and reported consistent associations with poorer quality of patient care, reduced patient satisfaction, increased adverse events, and organizational consequences including longer hospital stays and higher readmission rates [2]. Similarly, Kalánková et al. concluded that missed, rationed, or unfinished nursing care negatively influences patient outcomes in the context of patient safety and quality of nursing care [4]. These findings underscore the importance of monitoring nursing care quality not merely as a process indicator

but as a determinant of tangible clinical endpoints, a relationship also supported by evidence linking nurse staffing to patient outcomes [9,10].

In the Saudi Arabian context, several studies have examined patient satisfaction with nursing care, generally reporting high levels of satisfaction, yet these investigations have often been confined to major metropolitan centres such as Riyadh and Jeddah [6,16]. For instance, a study at King Khalid University Hospital reported that 77.6% of patients felt nurses treated them with courtesy and respect, and 90.3% were satisfied with hospital sanitary measures, with surgical outcomes including a 10.9% complication rate and 0.9% mortality [16]. However, the linkage between patient-reported nursing care quality and objective clinical outcomes such as nosocomial infection and length of stay has been insufficiently explored in regional hospitals, including those in the Northern Border region [5,17]. The College of Nursing at Northern Border University, Arar, is strategically positioned to address this gap through locally relevant research that informs nursing practice and healthcare policy [5,6].

The period of April 2022 to December 2022 represents a critical phase in the post-pandemic recovery of Saudi hospitals, during which nursing workloads, infection control practices, and patient acuity patterns underwent significant shifts [11-13]. Understanding how nursing care quality relates to clinical outcomes during this period provides actionable evidence for nursing administrators and quality improvement teams [11,14]. Furthermore, the use of a validated Arabic instrument for measuring patient satisfaction with nursing care quality enables culturally appropriate and psychometrically sound assessment in Arabic-speaking populations [1]. This study therefore addresses a significant evidence gap by quantifying nursing care quality and examining its association with objectively measured clinical outcomes among hospitalized patients in Arar, Saudi Arabia [1,5].

OBJECTIVE

The primary objective of this study was to assess the level of nursing care quality as perceived by hospitalized patients admitted to medical-surgical wards at a tertiary care hospital in Arar, Saudi Arabia, during the period from April 2022 to December 2022. Nursing care quality was operationalized using the Arabic version of the Patient Satisfaction with Nursing Care Quality Questionnaire (PSNCQQ), which captures patient evaluations of nursing care processes, communication, responsiveness, and the care environment.

The secondary objective was to examine the association between patient-perceived nursing care quality and selected clinical outcomes, specifically hospital-acquired infections, length of hospital stay, and in-hospital mortality [2,4]. It was hypothesized that higher levels of perceived nursing care quality would be associated with lower rates of hospital-acquired infections, shorter length of stay, and lower in-hospital mortality, consistent with international evidence linking nursing care quality to patient safety and clinical effectiveness.

METHODOLOGY & MATERIALS

Study Design and Setting

A cross-sectional, correlational study design was employed. The study was conducted at the medical-surgical wards of a tertiary care hospital affiliated with the College of Nursing, Northern Border University, Arar, Saudi Arabia, over a nine-month period from April 2022 to December 2022. The hospital serves as a major referral center for the Northern Border region and provides inpatient medical, surgical, and critical care services.

Study Population and Sample Size

The target population comprised adult patients aged 18 years and older who were admitted to the medical-surgical wards during the study period and who had a minimum hospital stay of 48 hours at the time of data collection. The sample size was determined using Krejcie and Morgan's formula for a finite population, with a 95% confidence level and a 5% margin of error, yielding a minimum required sample of 44 participants; 48 patients were ultimately enrolled to account for potential incomplete data. Participants were recruited using a convenience sampling technique.

Inclusion Criteria

Patients were eligible for inclusion if they: (1) were aged 18 years or older; (2) had been hospitalized for at least 48 hours in a medical-surgical ward; (3) were clinically stable and oriented to person, place, and time at the time of data collection; (4) were able to read and comprehend Arabic or had a family member available to assist with reading the questionnaire; and (5) provided written informed consent to participate.

Exclusion Criteria

Patients were excluded if they: (1) were admitted to intensive care units, emergency departments, or obstetric wards; (2) had a documented diagnosis of cognitive impairment or psychiatric illness that precluded reliable self-report; (3) were receiving palliative or end-of-life care; (4) had been hospitalized for fewer than 48 hours; or (5) declined to participate or withdrew consent at any stage.

Data Collection Procedure

Data were collected using a structured, self-administered questionnaire and a medical record review form. The questionnaire comprised two sections: (1) a sociodemographic and clinical characteristics form capturing age, sex, marital status, education level, admission type, and comorbidities; and (2) the Arabic version of the Patient Satisfaction with Nursing Care Quality Questionnaire (PSNCQQ), a 17-item instrument with demonstrated psychometric properties in Arabic-speaking populations, including a content validity index of 0.94 and an overall Cronbach's alpha of 0.96. Items were rated on a 5-point Likert scale (1 = very poor to 5 = very good), and a mean composite score was calculated, with higher scores indicating higher perceived nursing care quality. Clinical outcome data hospital-acquired infection status (confirmed by laboratory culture and documented by the treating physician), length of stay in days, and discharge status (alive vs. in-hospital death) were extracted from each participant's medical record by a trained research assistant who was blinded to the questionnaire responses. Data collection occurred between April 2022 and December 2022, with each participant completing the questionnaire on the day of discharge or within 24 hours prior to discharge.

Statistical Data Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA) [1]. Descriptive statistics (means, standard deviations, frequencies, and percentages) were used to summarize sociodemographic characteristics, PSNCQQ scores, and clinical outcomes. Normality of continuous variables was assessed using the Shapiro–Wilk test. The association between PSNCQQ scores and length of stay was examined using Pearson's correlation coefficient. Binary logistic regression was used to examine the association between PSNCQQ scores and hospital-acquired infection (yes/no), adjusting for age, sex, and number of comorbidities. Given the small number of mortality events (n = 2), in-hospital mortality was described descriptively and not entered into multivariable regression to avoid model instability. A p-value of <0.05 was considered statistically significant.

RESULTS

Patient Characteristics and Nursing Care Quality Scores

A total of 48 hospitalized patients were enrolled, with a mean age of 52.3 ± 15.6 years; 54.2% (n = 26) were male and 45.8% (n = 22) were female. The majority were married (72.9%, n = 35), and 43.8% (n = 21) had completed secondary education or higher. The most common admission types were medical (58.3%, n = 28) and surgical (41.7%, n = 20), and 62.5% (n = 30) had at least one comorbidity. The mean overall PSNCQQ score was 3.89 ± 0.62 on a 5-point scale, indicating a moderate-to-high level of perceived nursing care quality. Item-level analysis revealed that the highest-rated aspects were "nurses' respect for patient privacy" (mean = 4.15 ± 0.71) and "nurses' courtesy and friendliness" (mean = 4.08 ± 0.69), whereas the lowest-rated aspects were "nurses' promptness in responding to call bells" (mean = 3.54 ± 0.88) and "information provided about tests and procedures" (mean = 3.61 ± 0.82) (Table 1).

Table 1. Patient Characteristics and PSNCQQ Scores (N = 48)

Characteristic	Category	n (%) or Mean ± SD
Age (years)		52.3 ± 15.6
Sex	Male	26 (54.2)
	Female	22 (45.8)
Marital status	Married	35 (72.9)
	Single/divorced/widowed	13 (27.1)
Education	Secondary or higher	21 (43.8)
	Below secondary	27 (56.2)
Admission type	Medical	28 (58.3)
	Surgical	20 (41.7)
Comorbidities	None	18 (37.5)
	One or more	30 (62.5)

Characteristic	Category	n (%) or Mean ± SD
Overall PSNCQQ score (range 1–5)		3.89 ± 0.62
Highest-rated item: Privacy respected		4.15 ± 0.71
Lowest-rated item: Promptness to call bells		3.54 ± 0.88

Clinical Outcomes

Hospital-acquired infections were documented in 6 patients (12.5%), comprising surgical site infections (n = 2), urinary tract infections (n = 2), bloodstream infections (n = 1), and pneumonia (n = 1). The mean length of hospital stay was 7.4 ± 3.8 days (range: 3–18 days), and the median was 6 days. In-hospital mortality occurred in 2 patients (4.2%), both of whom had multiple comorbidities and were admitted with medical diagnoses. The distribution of clinical outcomes by PSNCQQ tertile is presented in Table 2. Patients in the highest PSNCQQ tertile (score >4.2) had a lower infection rate (6.3%) and shorter mean length of stay (5.8 ± 2.1 days) compared with those in the lowest tertile (score <3.6), who had an infection rate of 18.8% and a mean length of stay of 9.2 ± 4.5 days.

Table 2. Clinical Outcomes by PSNCQQ Tertile

Outcome	Lowest Tertile (PSNCQQ <3.6, n = 16)	Middle Tertile (PSNCQQ 3.6–4.2, n = 16)	Highest Tertile (PSNCQQ >4.2, n = 16)
Hospital-acquired infection, n (%)	3 (18.8)	2 (12.5)	1 (6.3)
Length of stay (days), mean ± SD	9.2 ± 4.5	7.1 ± 3.2	5.8 ± 2.1
In-hospital mortality, n (%)	1 (6.3)	1 (6.3)	0 (0.0)

Association Between Nursing Care Quality and Clinical Outcomes

Pearson correlation analysis revealed a statistically significant negative correlation between overall PSNCQQ scores and length of hospital stay ($r = -0.41$, $p = 0.004$), indicating that higher perceived nursing care quality was associated with shorter hospital stays. Binary logistic regression, adjusted for age, sex, and number of comorbidities, showed that each one-point increase in the overall PSNCQQ score was associated with a 68% reduction in the odds of hospital-acquired infection (adjusted OR = 0.32, 95% CI: 0.12–0.87, $p = 0.025$) [17]. The model explained 28.4% of the variance in infection status (Nagelkerke $R^2 = 0.284$) and demonstrated adequate fit (Hosmer–Lemeshow $\chi^2 = 6.12$, $p = 0.634$). Due to the small number of mortality events, in-hospital mortality was not included in the regression model; however, the descriptive data suggested that patients who died had lower PSNCQQ scores (mean = 3.25 ± 0.49) than survivors (mean = 3.92 ± 0.61) (Table 3 and Table 4).

Table 3. Correlation and Logistic Regression Results for PSNCQQ and Clinical Outcomes

Analysis	Outcome	Statistic	p-value
Pearson correlation	Length of stay (days)	r = −0.41	0.004
Binary logistic regression (adjusted)	Hospital-acquired infection	OR = 0.32 (95% CI: 0.12–0.87)	0.025
Model fit		Nagelkerke $R^2 = 0.284$; Hosmer–Lemeshow p = 0.634	

Table 4. PSNCQQ Scores by Mortality Status (Descriptive)

Status	n	Mean PSNCQQ ± SD
Survived to discharge	46	3.92 ± 0.61
In-hospital death	2	3.25 ± 0.49

DISCUSSION

This study provides empirical evidence from the Northern Border region of Saudi Arabia demonstrating that patient-perceived nursing care quality is significantly associated with objective clinical outcomes among hospitalized patients [1,5]. The mean PSNCQQ score of 3.89 ± 0.62 indicates a generally favorable perception of nursing care

quality, which aligns with the high satisfaction levels reported in other Saudi studies, including the 77.6% courtesy-and-respect rating at King Khalid University Hospital [6,16]. However, the variability in scores across items particularly the lower ratings for promptness in responding to call bells and information provision suggests specific domains of nursing practice that warrant targeted improvement [1,2]. These findings are consistent with the conceptualization of nursing care quality as a multidimensional construct that encompasses not only technical competence but also interpersonal processes and timely responsiveness [2,3].

The significant negative correlation between PSNCQQ scores and length of stay ($r = -0.41$, $p = 0.004$) and the adjusted odds ratio of 0.32 for hospital-acquired infection associated with higher PSNCQQ scores provide quantitative support for the pathway linking nursing care quality to patient outcomes [2,4]. These results resonate with the international literature on missed nursing care, which has consistently documented that deficiencies in nursing care processes such as delayed responses, incomplete fundamental care, and inadequate patient education are associated with increased adverse events, prolonged hospitalization, and higher readmission rates [2,4]. The present study extends these findings by demonstrating that the association holds in a Saudi regional hospital context using a validated Arabic instrument, thereby addressing a notable gap in the literature [1,5]. The finding that patients in the highest PSNCQQ tertile had a mean length of stay of 5.8 days compared with 9.2 days in the lowest tertile is clinically meaningful and suggests that improvements in nursing care quality could yield substantial reductions in bed occupancy and healthcare costs [9,10].

From a policy and practice perspective, these results have several implications [3,6]. First, the specific items with the lowest ratings promptness in responding to call bells and information provision about tests and procedures represent actionable targets for nursing administrators [1,2]. Interventions such as optimizing nurse staffing levels, implementing structured communication protocols, and enhancing patient education practices may directly improve these dimensions of care quality [9,10]. The literature on nurse staffing and patient outcomes supports this approach, with systematic reviews indicating that higher registered nurse staffing levels are associated with reduced in-hospital mortality and fewer adverse events [9,10]. Second, the use of the PSNCQQ as a routine quality monitoring tool in Saudi hospitals could facilitate continuous assessment of nursing care quality and early identification of units or patient groups at risk for poor outcomes [1,3]. Third, the significant association between PSNCQQ scores and infection rates highlights the importance of integrating patient-reported quality measures into infection prevention and control strategies, rather than relying solely on clinical and microbiological surveillance [17,18]. The small number of mortality events precluded robust multivariable analysis of mortality, but the descriptive difference in PSNCQQ scores between survivors and non-survivors (3.92 vs. 3.25) is consistent with the broader literature linking nursing care quality to failure-to-rescue and mortality [4,11-15].

Several strengths of this study should be acknowledged [1,6]. It employed a validated Arabic instrument with robust psychometric properties, extracted clinical outcomes from medical records rather than relying solely on self-report, and focused on a geographically underrepresented region of Saudi Arabia [1,5,16]. However, the findings should be interpreted in light of the study's limitations, including the modest sample size, the single-center design, and the cross-sectional nature of the data, which precludes causal inference [3,4]. The small number of mortality events also limited the statistical power for mortality analyses [4]. Future research should employ longitudinal designs, larger multicenter samples, and objective nursing-sensitive indicators such as nurse staffing ratios and missed care reports to further elucidate the mechanisms linking nursing care quality to clinical outcomes in Saudi hospitals [2,9,10].

LIMITATIONS OF THE STUDY

This study has several limitations that warrant consideration [1,3]. First, the cross-sectional design precludes any causal inference; while significant associations were observed between PSNCQQ scores and clinical outcomes, the direction of these relationships cannot be established, and reverse causality cannot be ruled out [3,4]. Second, the sample size of 48 patients was modest and was drawn from a single tertiary care hospital in Arar, limiting the generalizability of the findings to other Saudi hospitals or regions [5,6]. Third, the small number of in-hospital mortality events ($n = 2$) precluded multivariable adjustment for mortality, and the descriptive comparison should be interpreted with caution [4]. Fourth, the use of convenience sampling may have introduced selection bias, as patients who were more satisfied or more literate may have been more likely to participate [1,16]. Fifth, clinical outcome data were extracted from medical records, which may be subject to documentation errors or underreporting of hospital-acquired infections [17,18]. Finally, the study did not capture nurse-related variables such as staffing levels, skill mix, or missed care reports, which are important mediators of the relationship between nursing care quality and patient outcomes [2,9,10]. Despite these limitations, the study provides valuable preliminary evidence to inform future research and quality improvement initiatives in the region [1,5].

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CONCLUSION

This study demonstrated that hospitalized patients in a tertiary care hospital in Arar, Saudi Arabia, perceived a moderate-to-high level of nursing care quality, with a mean PSNCQQ score of 3.89 ± 0.62 [1,6]. Importantly, higher perceived nursing care quality was significantly associated with favorable clinical outcomes: each one-point increase in the PSNCQQ score was associated with a 68% reduction in the odds of hospital-acquired infection, and higher scores were correlated with shorter hospital stays [2,4,17]. These findings contribute to the growing body of evidence that nursing care quality is not merely a patient-experience metric but a determinant of tangible clinical endpoints, including infection prevention and resource utilization [3,9,10]. The specific domains of nursing care with the lowest ratings promptness in responding to call bells and information provision offer concrete targets for quality improvement interventions [1,2].

From a policy and practice standpoint, the results support the integration of patient-reported nursing care quality measures into routine hospital quality monitoring and the prioritization of nursing workforce adequacy, communication training, and patient education as strategies to improve clinical outcomes. The College of Nursing at Northern Border University is well positioned to lead such initiatives through practice-academic partnerships that translate evidence into bedside practice. Future research should employ longitudinal and multicenter designs with larger samples, incorporate nurse-level variables such as staffing and missed care, and examine the mechanisms through which nursing care quality influences outcomes. Such evidence will be essential for achieving the quality and safety goals of Saudi Vision 2030 and for ensuring that patients across the Kingdom receive nursing care that is both technically excellent and humanly compassionate.

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